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Bibliography on Industrial Meteorology, p. 1187

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 5 OCTOBER, 1954 No. 10

AGRICULTURE · COMMERCE · AERIAL AND MARINE NAVIGATION · PUBLIC HEALTH · INDUSTRY · ENGINEERING
AMERICAN METEOROLOGICAL SOCIETY
1919

SPECIAL FEATURE IN THIS ISSUE

A Selective Annotated Bibliography on Industrial Meteorology

(For complete table of contents see back cover)

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FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to ring to the attention of meteorologists current literature in their field and in related fields and o provide bibliographic information on various subjects, as interest demands.

Part I contains abstracts of current literature in the fields of meteorology, oceanography, tc., arranged according to the Universal Decimal Classification.

Part II of each issue comprises a special annotated bibliography of important references n a special subject. No attempt is made to prepare exhaustive bibliographies; instead, the im is to include a representative cross section of the various aspects of a subject.

Bibliographies published in the successive issues of Vol. 1, 1950 were:

) **Atmospheric Pollution,** 2) **Aerobiology,** 3) **Cloud Physics,** 4) **Hail,** 5) **Tornadoes,** 6) **Volcanic Dust,** 7) **Climatic Changes,** 8) **Thunderstorms,** 9) **Icing,** 10) **Acoustical Propagation** and 11) **Evaporation.**

Those published in Vol. II, 1951 were:

) **Extended Forecasting,** 2) **Long Range Forecasting,** 3) **Soil Temperature,** 4) **Constants, Tables, tc.,** 5) **Climate of Near East,** 6) **Climate of Middle East,** 7) **Special Winds,** 8) **Radar Storm Detection,** 9) **Condensation Trails,** 10) **Climate of Northeast Africa** and 11) **Mountain Meteorology.**

Other bibliographies previously published were:

No.	Mo.	Vol. III, 1952	Vol. IV, 1953
1.	Jan.	**Climate—Northwest Africa**	**Turbulence Theory**
2.	Feb.	**Carbon Dioxide**	**Turbulent Diffusion and Exchange**
3.	March	**Climate—Argentina, etc.**	**Frost and Frost Forecasting**
4.	April	**Dew**	**Climate of Australia and New Zealand**
5.	May	**Objective Forecasting**	**High Level Winds (500–100 mb)**
6.	June	**Stratus Forecasting**	**High Level Winds (above 100 mb)**
7.	July	**Urban Climatology**	**Jet Stream**
8.	Aug.	**Climate—Central Africa**	**Radiation Bioclimatology**
9.	Sept.	**Visibility**	**Climatology of the Pacific**
10.	Oct.	**Glaze and Rime**	**Auroras**
11.	Nov.	**Free Air Turbulence**	**Sferics**

Bibliographies published this year are:

1. **General Oceanographic Meteorology,** Vol. V, No. 1, Jan. 1954
2. **Climate of Southeast Asia and Netherlands Indies,** Vol. V, No. 2, Feb. 1954
3. **Physics of Auroras,** Vol. 5, No. 3, March 1954
4. **Tropopause,** Vol. 5, No. 4, April 1954
5. **Balloons,** Vol. 5, No. 5, May 1954
6. **Numerical Forecasting,** Vol. 5, No. 6, June 1954
7. **Radiation Data,** Vol. 5, No. 7, July 1954
8. **Vertical Motion,** Vol. 5, No. 8, Aug. 1954
9. **Climatology of the Arctic Basin,** Vol. 5, No. 9, Sept. 1954
10. **Industrial Meteorology,** Vol. 5, No. 10, Oct. 1954

Forthcoming bibliography will be:

11. **Wind Waves and Swell,** Vol. 5, No. 11, 1954

Other bibliographies in preparation are:

Actinometers
Arctic Synoptic Meteorology
Climate of the Arctic
Cosmic Rays in the Atmosphere
Fog Forecasting
Indoor Climatology
Microwave Propagation
Night Airglow
Ocean-Atmosphere Energy Exchange
Ozone
Singularities
Snow Cover
Synoptic Aerology
Tropical Cyclones

Part III contains a listing of the contents of those journals which are primarily meteorological. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. In the December issue umulative author, subject, geographical and journal indexes are published.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where t material may be found. The Union List of Serials (Gregory) is the source of most of t symbols used. In some cases, where no symbol has been assigned to a library, one will devised according to the principles of the Union List.

Library symbols used frequently may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DBS:	U. S. Bureau of Standards Library, Washington, D. C.
DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DN-HO:	U. S. Navy Hydrographic Office Library, Suitland, Md.
DSG:	U. S. Army Medical Library, Washington, D. C.
DSI:	Smithsonian Institution Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain, Meteorological Office Library, Harrow, England.
MH-BH:	Harvard University, Blue Hill Observatory (and American Meteorologi Society) Library, Milton, Mass.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
!	before an entry indicates a synoptic case history study accompanied by char

Geographic locations are in the English form rather than the form used locally, for examp Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherw stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Num (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus entry will read as follows:

Meteorologische Rundschau, 2(5/6):146–151, May/June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (2), *Heft* 5/6 (No. 5/6), *pages* 146–151, May/June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

WORKS OF SPECIAL INTEREST

5.10–1 551.5(02)

Flechtner, Hans-Joachim, **Du und das Wetter. Eine Wetterkunde für Jedermann.** [You and the weather. Everyman's meteorology.] Berlin, Deutscher Verlag, **1953.** 359 p. 16 photos, 202 diagrs. **DLC**—The 1940 ed. varies slightly. 365 p. 16 photos, 210 diagrs., bibliog. p. 366. In German script. 1953 ed. in Roman type. *See* 3.8–27 for Spanish trans. of 1940 ed. **DLC**—The first edition of this popular text on the weather was a few pages larger than the second edition, although the latter contains a new chapter (p. 88–102) on the structure of the atmosphere and a few changes here and there to bring the text up to date. The 3 major parts of the text concern (1) "The Ocean of Air" or atmosphere; (2) The General (and local) Circulation; and (3) "The Weather." The sun, radiation and properties of the atmosphere and their influence on life are taken up in a popular but accurate fashion in (1); the dynamics of the atmosphere, air currents, air masses, fronts, storms, water vapor, clouds, thunderstorms, precipitation, dew, frost, etc. in part (2); and weather maps, forecasts, climate, climatic change, bioclimatology, pseudo meteorology, etc. in part (3). The text is full of schematic diagrams, charts, graphs, marginal illustrations and vivid photographs. *Subject Headings:* **1. Elementary meteorology 2. Textbooks.**—*M.R.*

5.10–2 550.3:551.5

*†**Handbuch der Geophysik,** Vol. 8. Berlin, Borntraeger, **1942.** Edited by Franz Linke. 3 Pts. in 721 p. Detailed table of contents for Ch. 1–6 (p. 1–338) and brief table of contents for Ch. 7–12 at beginning of Pt. 1. figs., refs., tables, eqs. **DWB**—The first Lieferung of this elaborate volume of the famous Handbook of Geophysics contains detailed chapters on the sun as source of radiation and its physical characteristics, atmospheric aerosols, fundamental laws of radiation, illumination, etc.; instruments and methods of measurement of radiation and light, spectroscopy, etc.; theories of sun and sky radiation (scattering, extinction, polarization) all by the late F. LINKE. Another chapter by F. LINKE on short wave sky radiation, one by PAUL GÖTZ on the light of the night sky, by PAUL GRUNER on twilight phenomena and by JENSEN on the polarization of sky light comprises Lieferung 2. A chapter on visibility by F. LINKE, one on refraction and reflection phenomena in water drops and ice crystals by RUDOLF MEYER and one on long wave radiation and radiative balance of the atmosphere by F. LINKE and F. MÖLLER comprise Lieferung 3. The volume contains an enormous amount of theoretical as well as experimental data (in the form of tables and graphs), and constitutes a compendium containing a comprehensive review of the knowledge and literature to date in these highly technical fields of physics of the atmosphere. *Subject Headings:* **1. Physics of the atmosphere 2. Geophysics 3. Compendiums. I. Linke, Franz** (*ed.*).—*M.R.*

5.10–3 551.526.8:551.584.3:551.482(436)

Institut für Wissenschaft und Kunst, Vienna, **Beiträge zur Limnologie der Wienerwaldbäche. Erster Bericht der Arbeitsgemeinschaft zur Erforschung der Wienerwaldbäche im Institut. . . .** [Contribution to the limnology of the Vienna forest streams. First report of the Institut. . . .] *Wetter und Leben, Sonderheft* 2, Sept. **1953.** 216 p. figs., tables, refs. **DLC**—This work forms a complete survey of the physics and biology of a mountain stream in the Alpine foreland. RUDOLF ZAWADIL (p. 38–40) summarizes rainfall and runoff, O. ECKEL (p. 41–47) the heat balance of the flowing water and temperature changes along its course, FRANZ SAUBERER (p. 48–51) the bioclimatology and INGE DIRMHIRN (p. 52–63) the radiation balance and penetration of radiation into the water. *Subject Headings:* **1. River temperatures 2. Microclimatology 3. Austria. I. Pleskot, Gertrud** (*ed.*).—*C.E.P.B.*

5.10–4 551.57:06 551.311.1:06 551.48/9:0

*International Union of Geodesy and Geophysics. Association of Scientific Hydrology. **Assemblée Générale d'Oslo, 19–28 août 1948.** [General Meeting in Oslo, Aug. 19–28, 1948.] [1950?] **V. 1. Travaux des Commissions de Potamologie et de Limnologie.** [Transactions of the Commissions for Potamology and Limnology.] 399 p. **V. 2. Travaux de la Commission de la Neige et des Glaciers.** [Transactions of the Commission for Snow and Glaciers.] 407 p. **V. 3. Travaux de la Comission des Eaux Souterrainnes.** [Transactions of the Commission for Ground Water.] 308 p. figs., tables, refs., eqs. **DWB**—A comprehensive symposium on the state of hydrological studies all over the world, presenting 140 papers a considerable part of which contain important information, new aspects and theories. Contents of the first volume: Presidential address by SLETTENMARK on the hydrology of Sweden (maps) and a paper on hydrological conditions in Norway. Thirteen papers deal with evaporation and transpiration from soil lysimeters, water surfaces and catchment areas, the hydrologic cycle, and the time lag of runoff, and present a large amount of data. Seventeen papers are presented on the forecasting of floods, potamology in general, storage effects, runoff variations, hydrometric measurements, electrical flood wave analysis and storm water runoff. The third group of papers contains 5 items on river loads. The second part, devoted to limnology, contains 3 papers on the water balance of lakes, 6 items on lake level variations and 8 items on lake currents caused by wind and by flowing water, including one paper on the prevention of freezing. Contents of the second volume: Presidential address by CHURCH, 2 papers on the distribution of ice and its interaction with weather processes, 2 important papers on snow and ice research, floods resulting from snow melting, physical changes in snow cover, effect of föhn winds, snow surveys and snow classification, altitude dependence of snow cover, etc., 3 papers on glacier ice crystals, 8 papers on glacier measurements, ablation and glacier variations and 12 papers on special glaciological research, climate and glaciers, runoff from glaciers, melting point of ice, etc. Six papers deal with supercooling and ice formation in lakes and rivers, prevention of freezing and general cryological problems. Contents of the third volume: Six papers on infiltration, percolation and evaporation from bare soil and their measurement by lysimeters, 6 papers on variations of ground water level and artesian pressure and their dependence on rainfall and air pressure, 14 papers on thermal sources and their chemical composition, 4 papers on regional ground water studies and, finally, 5 papers on soil profiles, soil humidity and ground water balance. Abstracts of papers, important for meteorologists, will be published separately. *Subject Headings:* **1. Hydrology 2. Lakes and rivers 3. Snow and ice research 4. Glaciology 5. Ground water research 6. Symposia. I. Slettenmark, Gustaf II. Church, J. E.**—*A.A.*

5.10–5 551.5:629.13(0

Jagsich, Juan (*Cordoba, Argentina*), **Meteorologia fisica; el tiempo.** [Physical meteorology; weather.] Buenos Aires, Kapelusz, **1953.** 547 p. 508 figs., illus. bibliog. p. 6— **DPU**—The author, who is Prof. of meteorology at the School of Military Aviation at Córdoba and Prof. of geodesy at the University of Córdoba, has written and presented here a very competent and attractive as well as voluminous text on physical meteorology and weather intended for students who intend to be aviators, but useful as well for students of agriculture, geography, engineering, etc. who wish to get a fundamental but not too technical background of physical processes involved in day-to-day weather. There are series of original illustrations of processes and considerable quantitative data to show the variations in elements from the average or standard conditions. The separate chapters take up are: 1. The atmosphere and its composition, 2. Thermal properties, 3. Moisture, 4. Precipitation, 5. Pressure, 6. Wind, 7. Storms and weather changes, 8. Electrical phenomena, 9. Optical phenomena and 10. Weather (daily, seasonal, spatial and periodic variations). The entire text shows remarkable originality and knowledge of the physics of the atmosphere, and is advanced in context for books of this type. The amount of quantitative and graphical material on subjects such as diurnal effects on pressure, wind, vertical movements, clouds and temperature or on optical, acoustical and electrical phenomena, etc. is amazing. Much of the illustrative material is from South American sources, although considerable is taken from European sources. No references are given to sources but a good 3 page general bibliography for further study is presented. *Subject Headings:* **1. Aeronautical meteorology 2. Physical meteorology 3. Textbooks.**—*M.R.*

5.10–6 551.508(02)

†Middleton, W. E. Knowles and Spilhaus, Athelstan F., **Meteorological instruments.** 3rd rev. ed. Toronto, Univ. of Toronto Press, **1953.** 286 p. 192 figs., numerous refs. **DWB**—When the first edition of MIDDLETON's text on meteorological instruments appeared in 1941, it was the only book of its kind to have been published in the English language since CLEVELAND ABBE's "Treatise on Meteorological apparatus and methods." Revisions, reprints or new editions came out in June and Nov. 1942, Jan. and May 1943, and in Feb. 1947. The present (3rd) edition contains a great deal of new material, but few changes in the old. For instance, radar observations of meteorological elements or electronic wind and spherics equipment, constant level balloon techniques, airplane reconnaissance, mobile stations, automatic weather stations, radio wave sounding and other new equipment or methods are given due attention. The general structure of the book remains simple: I. General properties of meteorological instruments, II. Pressure measurement, III. Temperature, IV. Humidity, V. Precipitation and evaporation, VI. Surface wind, VII. Upper air wind (*see* 5E–142, May 1954, *MAB*), VIII. Clouds and radiosondes, IX. Composite instruments and X. Sunshine. *Subject Headings:* **1. Meteorological instruments 2. Methods of observation 3. Textbooks.**—*M.R.*

5.10–7 551.5:061.1(492)(09)

Netherlands. (K.) Meteorologisch Instituut, **1854 Koninklijk Nederlands Meteorologisch Instituut 1954.** [The Netherlands Meteorological Institut, 1854–1954.] 'S-Gravenhage, Staatsdrukkerijen Uitgeverijbedrijf, **1954.** 469 p. numerous figs., including ports. and colored plated; tables, eqs., refs. List of publication of the Meteorological Institute, p. 448–461. **DWB?** Review by BLEEKER, W., **The Royal Netherlands Meteorological Institute (1854–1954).** *Nature*, London, 174(4422):203–204, July 31, **1954.**—**DLC** Memorial volumes in honor of some famous scientist are occasionally published in one country or another. Sometimes these volumes are quite elaborate. Here is a volume dedicated to the 100th anniversary of an institution—the first of its kind for a meteorological service, and a most elaborate and satisfactory volume even for those who cannot read Dutch. The large volume consists of 3 parts: The first part is mainly historical, consisting of chapters on the general history of meteorological services and the Netherlands service in particular, the influence and work of Buys Ballot (1854–90), the period of slow development (1890–1940) and the turbulent period of the war and rapid post-war development (1940–1954), the two International Polar Years (1882–3 and 1932–3), the role of the KNMI in the International (World) Meteorologica Organization, etc. Part II consists of a series of articles on the various services and departments of the KNMI: (1) Instruments, (2) Aviation Meteorological Service, (3) Climatology and Agricultural Meteorology, (4) Maritime Meteorology, (5) Physical Oceanography (6) Geophysics, and (7) Library and Publications. Part III consists of 10 first class scientific papers by members of the KNMI scientific staff: H. J. A. Vesseur, H. P. Berlage, H. C. Bjvoet, W. Van der Bijl, C. Levert, S. W. Visser, R. Dorrestein, G. Verploegh, and J. G. J. Scholte, and an appendix giving (a) a list of the members of the College of Curators (1899–1954), and (b) of the principal members of the staff of KNMI (1854–1954) including 7 chiefs and 26 directors, etc. and (c) 136 publications of members of the KNMI, etc. *Subject Headings:* **1. Netherlands Meteorological Service 2. History of meteorology. I. Buys-Ballot, C. H. D. II. Bleeker, W.**—*M.R.*

5.10–8 551.509.3

§Oosawa, K., **On the Baur's ten-day weather forecasting method applied in Japan.** *Journal of Meteorological Research*, Tokyo, 4(8):525–561, Nov. **1952.** 31 figs., tables, 5 refs. In Japanese; English summary p. (32)–(35). **MH-BH**—Points out that smoothing a pressure curve by the running average method can result in a distortion and even in a complete reversal in the phase of oscillations, if the ratio averaging interval to the period of the oscillation is near 1.4. A summation formula is proposed, which is essentially a repeated smoothing with the same interval. The remainder of the paper is based on 5 years of experience with Baur's forecasting methods, applying mainly 10-day mean pressure deviation charts from normal and 5-day pressure and temperature changes (sample maps for Far East presented). Analogous cases are selected taking "good care" of singularities. A distinct singularity in Japan is the

"Bai-u" weather, a summer monsoon situation with cold and rainy weather. The spells are usually concentrated around the 6th, the 18th and the 27th of June. *Subject Headings:* **1. Curve smoothing 2. Long range forecasting 3. Baur's method 4. Singularities 5. Japan.** —*A.A.*

5.10–9 551.55:551.57:551.515:551.509

§*Otani, T., **Converging line of the northeast trade wind and converging belt of the tropical air current.** *Geophysical Magazine*, Tokyo, 25(1/2):1–122, Jan. **1954.** 607 figs., tables. **MH-BH**—An elaborate study of several aspects of tropical meteorology, especially as it pertains to forecasting typhoons, their origin and development and the associated problem of the mechanism of heavy rainfall and squalls. The author prepared some 10,000 charts and made extensive vector wind and harmonic analysis computations over a period of 10 years, and in this paper has condensed the essence of this labor in his application of upper air winds to developments along the intertropical convergence zone. Both climatic (seasonal, mean and frequency) and synoptic variations are analyzed for the East Indies and for the relation between intertropical circulation and heavy rainfall in Japan. The author defines the "converging line" as the line along which the trade wind in the winter hemisphere terminates, or the demarcation line between the trades and doldrums. The "converging belt" is a narrow zone toward which the tropical air converges and then ascends advectively, and is said to be closely related to heavy rainfall in Japan and to typhoon formation. Special rules for forecasting the various events named above in Japan, the Caroline Islands and the East Indies are given. Extensive tables and numerous charts are also presented. *Subject Headings:* **1. Tropical meteorology 2. Typhoon forecasting 3. Excessive rainfall 4. Intertropical convergence zone 5. Streamline charts 6. East Indies 7. Japan.**—*M.R.*

5.10–10 551.593.1

Royal Meteorological Society and Royal Astronomical Society, **Stellar scintillation. Joint discussion, Dec. 16, 1953. Opening papers and general discussion.** *Royal Meteorological Society, Quarterly Journal*, 80(344):241–260, April **1954. MH-BH**—Contains: BUTLER, H. E., **Observations of stellar scintillation,** p. 241–245 (3 figs., 12 refs.); ELLISON, M. A., **Location, size and speed of refractional irregularities causing scintillations,** p. 246–248 (4 figs., 2 refs.); MEGAW, E. C. S., **Interpretation of stellar scintillation,** p. 248–251 (fig., 6 refs.); VAN ISACKER, J., **The analysis of stellar scintillation phenomena,** p. 251–254 (4 figs., 2 refs., 13 eqs.); Discussion p. 255–260, 2 figs., 6 refs. BUTLER discusses recordings of brightness scintillation with telescope and photomultiplier, showing increase with decreasing elevation. ELLISON discusses scintillation, dancing and pulsation in terms of turbulent elements, deducing a vertical height of 2.6 km and describes experiments in color scintillation. MEGAW discusses scintillation in terms of a homogeneously turbulent stream with a large uniform mean velocity across line of sight, scintillation being due to changes of temperature. VAN ISACKER deals with statistical analysis of scintillation observations in relation to $\sec^3 \theta$ law and the spectral distribution of thermal fluctuations. A good general discussion follows, including scintillation of radio stars and upper air temperature fluctuations. *Subject Heading:* **1. Scintillation.**—*C.E.P.B.*

5.10–11 551.578.46(02):7

*U. S. Forest Service, **Avalanche handbook.** Wash., D. C., **1953.** 146 p. 153 figs., 21 refs. Replaces its **Alta Avalanche Studies, 1948. DLC**—This is a readable, although in parts quite technical, handbook or textbook covering the historical, physical and practical aspects of avalanche occurrence, forecasting, protection, rescue and research with the main emphasis on saving life at winter sports (ski) centers. The examples are mainly from U.S. experience and research, though the important Swiss work has not been neglected. Special studies were made at Alta, Utah (Middle Alpine zone), Berthoud Pass, Colorado (High Alpine zone), Mt. Baker and Stevens Pass, Wash. (Coastal Alpine) for periods ranging from 1 to 5 years. During World War I, 80,000 soldiers perished from avalanches, and in the U.S. (March 1910) 3 trains were wiped out at once by an avalanche in Stevens Pass, Wash., with great loss of life. The winter of 1951–52 was as bad with respect to number of avalanches and property damage, though not in loss of life as 1909–10. The U. S. Forest Service Avalanche

Warning Service takes some of the credit. The causes of avalanches are: 1) terrain, 2) cover, 3) exposure and 4) weather. The contributory causes are usually a combination of a number of snow, weather and accidental factors such as old frozen snow under deep new snow, rainfall or thawing, wind, snow density, disturbance due to skiing, vibration, etc., rather than any one single factor. Wind is dominant as a contributory factor. Three types of avalanches are distinguished: dry (loose) snow, damp or wet snow, windslab or snowslab and combinations of the 3, including the climax type which is the most extensive of all, though rare. A great deal of meteorological data, graphs, photos of instruments and equipment and of different types of slides are included. *Subject Headings:* **1. Avalanche research 2. Avalanche warning service 3. Textbooks 4. Winter sports 5. Alta, Utah 6. Stevens Pass, Wash. I. Atwater, Montgomery M. II. Koziol, Felix C.**—*M.R.*

GENERAL METEOROLOGY

See also: **Everyman's met.** (Flechtner), 5.10–1; **Handbook of Geophys.,** 5.10–2.

5.10–12 551.5

Baum, Werner A. (*Florida State Univ., Dept. of Meteorology, Tallahassee, Fla.*), **Accrediting problems in meteorology.** *American Meteorological Society, Bulletin,* 34(7):319–320, Sept. **1953.** ref. **MH-BH**—The author proposes that the American Meteorological Society become an accrediting agency, that accrediting be limited to institutions willing to provide fundamental support for academic meteorology and that geographical curricula in climatology be eliminated from professional accreditation. *Subject Headings:* **1. Meteorological consultants 2. Meteorology.**—*I.L.D.*

5.10–13 551.5(26) 551.46(02)

Ångström, Anders, **Väder och vind.** [Weather and wind.] (In: **Boken om Havet,** Vol. 2:160–192. Stockholm, Sohlman, **1951.** 17 figs., table.) Also Liljequist, Gösta H., **Väderlekstjänsten** [and] **Isar och israpporttjänst.** [Weather service] and [Ice and ice reporting service]. *Ibid.,* p. 193–208 and 209–228. photos., diagrs. classified bibliog. p. 517–520. **DLC**—A nicely illustrated and edited book on natural science and oceanography, including a chapter by ÅNGSTRÖM on general and synoptic meteorology, storms and wind, clouds, air masses, fronts, hurricanes, etc.; a chapter by LILJEQUIST on weather stations, codes, reports, charts, soundings, and one on sea ice and ice reporting in the Atlantic, Arctic and Baltic, and notes on ice forecasting. There are also chapters on tides, waves, marine chemistry, physics, geology, biology, navigation, nautical instruments, etc. *Subject Headings:* **1. Marine meteorology 2. Meteorological stations 3. Sea ice reporting services 4. Textbooks 5. Oceanography.**—*M.R.*

5.10–14 551.5:025.45

World Meteorological Organization. Commission for Bibliography and Publications, First Session, Paris 1953, **Suggestions for revisions of Universal Decimal Classification of meteorology for consideration of Commission for Bibliographies and Publications. Submitted by the Meteorological Office, London.** Its *CBP-I*/Doc. No. 28, Nov. 5, **1953.** 9 p. Mimeo. **DWB**—A few important additions or subdivisions are suggested, i.e., standard atmospheres, ice accretion instruments, numerical forecasting, tropopause, structure of upper atmosphere, turbulence, micrometeorology and, most important of all, subdivision of 551.511 (Mechanics and Thermodynamics of Atmosphere). Useful examples are given for each suggestion. *Subject Headings:* **1. Meteorological classification 2. U.D.C. for Meteorology.**—*M.R.*

5.10–15 551.5:06

Technical assistance programme. *World Meteorological Organization, WMO Bulletin,* 11(4):116–118, Oct. **1953. DWB**—Nine countries benefit from technical assistance program in 1953 and 21 or 22 in 1954. The 1953 program in Bolivia, China, Dominican Republic, Israel, Jordan, Libya, Yugoslavia, Southern Rhodesia and Thailand is reviewed for each country. Some of this assistance involves fellowships to study abroad. *Subject Heading:* **1. WMO. Technical Assistance Program.**—*M.R.*

5.10–16 551.5:0

Veranneman, Norbert L., **Synoptic meteorology.** *World Meteorological Organization WMO Bulletin*, 11(4):101–107, Oct. **1953. DWB**—At the First Session of the WMO Com mission for Synoptic Meteorology held in Washington, D. C., April 1953, 28 countries wer represented. Two technical commissions and six other organizations were also represented Details of the work are given—the main item being, of course, the standardization of the basi synoptic and aerological codes, etc. For the first time a uniform set of codes has been accepte by all countries. Some modifications or suggestions for modifications were made in code symbols, times of observations, etc. The International Cloud Atlas, Draft Provisional Tech nical Regulations, telecommunications, networks, publication date of introduction of new cod (Jan. 1, 1955), terminology glossary, etc. are discussed. Two scientific sessions were held *Subject Headings:* **1. Synoptic meteorology 2. WMO. Commission for Synoptic Meteorolog 3. Synoptic codes—1955.**—*M.R.*

5.10–17 551.5:620.19:629.1

Sims, R. F., **The wear of carbon brushes at high altitudes and discussion.** *Institutio of Electrical Engineers*, Pt. II, 101(81):217–226, June **1954.** 8 figs., 6 refs. **DWB**—Th carbon brush depends for its frictional properties on atmospheric water. At high altitude where the atmosphere is very dry, friction is high and wear rate is catastrophic. Laboratory apparatus for the study of the phenomenon must simulate the conditions in the upper a mosphere. Conventional lubricants are unsuitable on account of their effect on the electrica contact and their failure to withstand the conditions at the rubbing face. Effective inorgani lubricants give immunity by building up a stable film on the commutator surface, but the adversely affect machine performance. Also contains considerable data in graphic form c relation of meteorological elements to brush corrosion and on variability of these elements wit altitude. *Subject Headings:* **1. Engineering meteorology 2. High altitude flying 3. Cor rosion.**—*Author's abstract.*

5.10–18 551.508:621.3

Jimenez, Basillo M., **Electronics in meteorology.** *Philippines. Weather Bureau, Th Elements*, 3(3):9–10, March **1952. DWB**—In addition to electronic equipment in use at th Philippine Weather Bureau (radiosonde, ceilometer) and elsewhere (rawisonde, radar), th author describes two electronic techniques suggested by J. S. ENGELL, namely: (1) a clou depth indicator controlled by a photoelectric cell and attachable to the radiosonde and (determination of air masses by a system of one very-high-frequency radiowave transmitte and several receivers. *Subject Heading:* **1. Electronic equipment.**—*G.T.*

5.10–19 551.5:621.3

Kakas, József, **A távvezeték ellenségei.** [Enemies of power lines.] *Élet és Tudomány* Budapest, 6(40):435–437, Oct. 3, **1951.** photos. **DLC**—The shortest way is not necessarily the least expensive one as far as electrical power lines are concerned. A meteorologist usually among the experts whose task it is to mark the path along which the main lines will b constructed. The author discusses three meteorological phenomena which may affect powe lines: lightning, rime and icing. The risk of the first two can be lowered by proper choic of location, the third can only be controlled by wire heating. A case is mentioned in which coating of ice 25–40 mm in diameter was deposited by sleet on a 2 mm wire, increasing it weight some 20 times (southwestern Hungary, Feb. 1947). *Subject Headings:* **1. Lightnin strokes 2. Rime damage 3. Icing of cables 4. Hungary.**—*G.T.*

5.10–20 551.5:

Wagner, Richárd, **A táj és a légkör.** [Landscape and atmosphere.] *Időjárás*, Budape 57(4):198–207, July/Aug. **1953.** Russian and German summaries p. 198. Discussion: *Ibid* 58(1):64, Jan./Feb. **1954. MH-BH, DLC**—Deals with the atmosphere as an object of bo meteorology and geography, with the concept of landscape and with the relation of weath and climate to landscape. The connections between geography, meteorology, climatolog and physics are discussed and an attempt is made to determine the scopes of these scienc within the field of atmospheric research. *Subject Headings:* **1. Meteorology 2. Geograph 3. Classification of science.**—*Author's abstract* (*trans.*).

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

See also: **Rocket res. in upper atmos.** (Boyd), 5.10–49; **Investigations of cumuliform cloud,** 5.10–185.

5.10–21 551.501:551.551

Edinger, J. C. (*Univ. of Calif. at Los Angeles*), **A technique for measuring the detailed structure of atmospheric flow.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers,* No. 19:241–261, Dec. **1952.** figs., 5 refs. **DWB**—The horizontal motion of air at 1000 ft above the ground is studied by means of motion picture photography of soap bubbles released below a captive balloon. This method gives the turbulent variations in a Lagrangian coordinate system. The patterns of turbulent flow are shown in the form of trajectories. The results for the standard deviation of bubble positions agree quite well with Taylor's theory. Furthermore, the mean squared separation of bubble pairs is studied following the lead of RICHARDSON and KOLMOGOROV. *Subject Headings:* **1. Soap bubble releases 2. Turbulence measurement.**—*A.A.*

5.10–22 551.501:551.571

Iyengar, B. R. Y. (*National Chemical Lab. of India, Poona*), **On the measurement of vapour pressures by the Hill-Baldes thermoelectric technique.** *Journal of Scientific and Industrial Research,* 13B(1):73–75, Jan. **1954.** table, 11 refs., 11 eqs. **NWB**—Steady state temperature difference between a drop of solution and that of solvent or reference solution is expressed on the basis of (a) theory of evaporation of droplets, (b) humidity theory, (c) observed values and (d) an empirical equation. Results obtained by these four methods are presented in a comparative table for a number of solvents. *Subject Heading:* **1. Vapor pressure measurement.**—*G.T.*

5.10–23 551.501:551.524.1:551.508.29

McDonald, James E. (*Dept. of Physics, Iowa State Coll., Ames*), **Measurement, analysis, and interpretation of turbulent temperature fluctuations.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers,* No. 19:263–282, Dec. **1952.** figs., 18 refs., eqs. **DWB**—Spurious fluctuations of an exposed bead thermistor arise because of fluctuations in wind speed. The error introduced, measuring air temperatures, is less than 10% if the average amplitude of wind speed fluctuations is 25% of the mean speed. Furthermore the distortion of fluctuation statistics by the instrument lag is analyzed, giving general relations between the true and the apparent statistics. The radiation error reaching up to 0.5°C depends on the solar hour angle. The lag time is about 0.1 sec at greater wind speed and increases rapidly with decreasing speed. *Subject Headings:* **1. Temperature fluctuations 2. Thermistor errors 3. Temperature measurement.**—*A.A.*

5.10–24 551.501:551.574.41

Roginski, Stefan, **Metody pomiaru rosy.** [Methods of measuring dew.] *Gazeta Obserwatora PIHM,* Warsaw, 4(12):7–9, Dec. **1951.** 2 figs. **DWB**—After having explained the origin and causes of dew formation and having pointed out that an accurate measurement of its amount is difficult in view of numerous factors influencing its formation and further development, the author enumerates and describes a number of methods of measuring dew and points out the imperfections of every one of them (methods of WOLLNY, KERNER and ADRIANOV, HONDIALLE, VISSER, PARSHINGER, HILTNER, LEICK, STEPHAN and MILDEBRATH, GALLENKAMPF and DUVDEVANI). The paper concludes with a remark that the lack of investigations in Poland does not permit one to determine the amount of dew during the vegetation period and makes impossible the estimation of its share in the water balance of the country. *Subject Headings:* **1. Dew measurement techniques 2. Dew formation.**—*A.M.P.*

5.10–25 551.501.1(02)

U. S. Weather Bureau, **Instructions for climatological observers.** Its *Circular B,* 10th ed. Nov. **1952.** 60 p. tables, figs. p. II, History (and list) of publications incorporated in

Circular B, 10th ed., **1952.** Price $.50, from Govt. Print. Office. **DWB**—This well-illustrated and up-to-date manual combines the instructions contained in a score of more specialized manuals issued by the U.S.W.B. for various classes of voluntary observer stations from 1892–1950. The precipitation, temperature and evaporation stations or combinations thereof constitute the principle types of stations covered. Instructions for installation, care and reading of instruments and for recording data, compiling records and disposal of forms and recorder records are included. *Subject Headings:* **1. Cooperative observers manuals 2. Observers manuals 3. Manuals.**—*M.R.*

5.10–26 551.501.4:551.524.1:551.525.

Gutman, L. N., **O raschete temperatury prizemnogo sloia vozdukha.** [The calculation of temperature of the air layer near the ground.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofizicheskaia*, No. 5:451–459, **1953.** 2 tables, 14 refs., 29 eqs. **DLC**—The problem of variation in temperature of soil and of the air near the ground influenced by solar radiation is analyzed mathematically. The formulas given are simple enough to be applied to practical calculations. Theoretical conclusions need further experimental verification. An example of calculation of air temperature variation from actinometric observational data is presented. *Subject Headings:* **1. Temperature calculations 2. Temperature variations 3. Soil temperature variations**—*N.T.Z.*

5.10–27 551.501.6:551.5

Gumiński, Romuald, **Metoda izarytm w klimatologii.** [The method of isolines in climatology.] *Gazeta Obserwatora PIHM*, Warsaw, 4(11):2–9, Nov. **1951.** 9 figs. **DLC**—In view of the very important role played by isogram lines in climatology and the lack of adequate information concerning the drawing of them, the author presents a detailed and clear exposition of the principles and methods of drawing isohyets and isotherms—curved lines connecting points having same amount of precipitation and same temperature. Very important factors for drawing such maps are: the density of observation stations, the scale of the map and the length of the observation period. *Subject Headings:* **1. Isohyetal charts 2. Isothermal charts 3. Climatic studies.**—*A.M.P.*

5.10–28 551.501.8

Roll, Hans-Ulrich, **Wolken und Regen im Radar.** [Clouds and rain in radar.] *Wetterlotse*, 72:129–132, June **1954. DWB**—Explains that fog, cloud and sometimes even rain are not seen on the radar screen because as water drops reflect according to 6th power of the diameter, they must reach 1 mm (snow crystals, 1.5–3 mm) to be seen at 10 mi distance. *Subject Heading:* **1. Radar observations.**—*C.E.P.B.*

5.10–29 551.501.81:551.577.2(77

*Stout, Gleason E.; Neill, J. C. and Farnsworth, G. W., **Rainfall-radar studies of 195** Illinois. State Water Survey. Meteorologic Laboratory, Contract DA 36-039-sc-4244 Project DA 3-99-07-022, Project SC 24-172B, Research Report, No. 1, May **1953.** 41 15 tables, 33 figs., 16 refs. *Illinois. State Water Survey, Report of Investigation*, No. 1 **DWB**—Equipment was developed for the photographic recording of rain-intensity contou as observed by a 3 cm radar set, checking the results by a network of 37 recording gages on watershed and preparing isohyetal maps for each minute. The individual rates computed from radar deviated considerably from the rain gage measured rates, but mean areal rainfa could be estimated accurately. A calibrated radar could indicate rainfall intensity from 0. to 2.30 mm/hr. A rainfall summary from May to Oct. 1951 over the Goose Creek netwo is attached. (*See also* 4.7–24, July 1953, *MAB.*) *Subject Headings:* **1. Radar rainfall measurement 2. Rainfall intensity distribution 3. Goose Creek, Illinois. I. Illinois. State Water Survey. Meteorologic Laboratory II. Contract DA 36-039-sc-42446.**—*A.A.*

5.10–30 551.501.81:551.594

Vassy, Arlette and Vassy, Étienne, **Interpretation d'un type particular d'écho de radar** [Interpretation of a special type of radar echo.] *Académie des Sciences, Paris, Comptes Rendus*, 235(20):1240–1242, Nov. 17, **1952.** 2 refs. **DWB**—The peculiar radar echo from

cloudless sky (first observed by J. BROCH on a 3.2 cm radar over the ocean) was again observed in the summer of 1952. This paper is an attempt to interpret the phenomenon as a coincidence of meteorological factors favoring superrefraction. *Subject Headings:* **1. Angels 2. Radar echoes from cloudless sky 3. Superrefraction. I. Broch, J.**—*W.N.*

OBSERVATIONAL DATA

5.10–31 551.506:517.512.2

Neumann, J., **An abridged method for computing daytime and nighttime averages of some meteorological elements.** *Journal of Meteorology*, 11(3):185–188, June **1954.** fig., table, 3 refs., 17 eqs. **MH-BH**—Taking M as 24-hour mean of an element, M' and M'' as means from sunrise to sunset and sunset to sunrise, and assuming that diurnal variation can be represented by first two Fourier waves derived from at least four equidistant observations, expressions are obtained for M' and M'' in terms of half-length of day (given by a nomogram in terms of date and latitude) and the values at four observation hours. *Subject Heading:* **1. Harmonic analysis.**—*C.E.P.B.*

5.10–32 551.506:633.88

Schwerdtfeger, Gertrud, **Abhängigkeit des Glycosidgehalts der Digitalis lanata von der Witterung.** [Relation of the glycosin content of *Digitalis lanata* to the weather.] *Meteorologische Rundschau*, 7(3/4):64–66, March/April **1954.** 4 tables, 3 refs. **DWB**—Glycosin determinations at Stuttgart on leaves grown under comparable conditions in 1949–53 showed that short periods of warm dry summer weather rapidly increased yield. *Subject Headings:* **1. Weather effects 2. Digitalis.**—*C.E.P.B.*

5.10–33 551.506.1:629.13(09)

§**Flying the weather map with the Wright Brothers.** *Weatherwise*, 6(6):164–165, Dec. **1953. MH-BH**—In honor of the 50th anniversary of the first powered flight, the U. S. Weather Bureau map for Thursday, Dec. 17, 1903 is reproduced, and a quotation from the *Monthly Weather Review* of Dec. 1903 gives an "on the spot" description of wind and weather conditions at Kittyhawk, N. C. on the day in question. The account was written by a Weather Bureau observer who was stationed at Kittyhawk, N. C. *Subject Headings:* **1. Flying weather at Kittyhawk (Dec. 1903) 2. Wright Brothers first flight 3. Kittyhawk, N. C.**—*M.R.*

5.10–34 551.506.2(7)

Ludlum, David M. (*ed., Weatherwise*), **Winter starts on a mild note.** *Weatherwise*, 6(1):18–21, Feb. **1953.** figs. **MH-BH**—Weather development and circulation over the North American continent during Sept.–Dec. 1952 is described and illustrated by U. S. Weather Bureau monthly temperature and precipitation charts. Among other features, the author mentions a 45-day rainless period in Louisiana and Mississippi (2nd longest on record) ending in Sept.; an intense Nov. storm with a record 18.2-inch 24 hour snowfall at Knoxville; a "warm blizzard" in Nov.; and a Florida freeze in Dec. with frost on both sides of a rain area. *Subject Headings:* **1. Weather summaries 2. United States.**—*G.T.*

5.10–35 551.506.2:551.513.3

Ludlum, David M. (*ed.*), **The abnormalities of spring make big news.** *Weatherwise*, 6(4):108–110, Aug. **1953.** 4 figs. **MH-BH**—Unusual events were: (1) Rio Grande dried up at Laredo, Tex. for first time in history, due to 3 year drought; (2) coldest spring in far West for years; (3) Tornadoes in New England; (4) record spring heat in Southeast U. S. Cause of these abnormalities laid not to the atom bomb tests or cloud seeding, but to a westward shift of the Bermuda High and intensification of the mean trough so that more cold air came down in the West and more hot moist air came north in the East and the area of mixing was narrowed and intensified to produce greater storminess. Floods in April and May followed by June drought (in Louisiana) and a May hurricane in the Caribbean were additional features reported. *Subject Headings:* **1. Abnormal spring, 1953 2. Drought, United States (1953) 3. Climatic extremes 4. United States.**—*M.R.*

5.10–36 551.506.5(235.243

Pugh, L. G. C. E., **Notes on temperature and snow conditions in the Everest region i spring 1952 and 1953.** *Journal of Glaciology*, 2(15):363–365, April **1954.** 2 tables, 2 ref **DWB**—Observations of shade and sun temperature in April and May at heights up to 27,90 ft are set out and snow conditions summarized. Conditions at 17,500–21,000 ft were simila to those at 10,000–15,000 ft in the Alps at the same season. *Subject Headings:* **1. Expeditionar climatic data 2. Mount Everest.**—*C.E.P.B.*

5.10–37 551.506.5:551.582.2(269

*§Vowinckel, E. and Oosthuizen, C. M., **Weather types and weather elements over th Antarctic Ocean during the whaling season.** *South Africa. Weather Bureau, Notos*, 2(3):157 182, **1953.** 4 figs., 3 tables, 12 charts (2 fold.). **DWB**—About 16,500 ships' observations fo the whaling seasons 1949/50, 1950/51, 1951/52 and 1952/53 were used to obtain diverse 'climato logical' statistics for various meteorological elements over an extended section of the Antarcti Ocean. The presentation of the results is preceded by a discussion of the more importan weather types and their relative frequency of occurrence in four different sectors of the are studied in order to provide some synoptic background for the interpretation of the pattern shown by the spatial distribution of the different statistics. Charts showing mean and clou amount, frequency of good visibility, fog, precipitation and gales, air and sea temperature windroses and the ice border are presented. *Subject Headings:* **1. Weather types 2. Marin climatic data 3. Antarctic weather 4. Whaling expeditions 5. Antarctic Ocean.**—*Author abstract.*

5.10–38 551.506.7(66)551.52

Goldsmith, P., **Some aircraft and surface meteorological observations made at Khartoum in July 1952.** *Great Britain. Meteorological Research Committee, M.R.P.*, 789, March 2 **1953.** 8 p. 3 figs., 2 tables, 5 refs. Mimeo. **GB-MO**—Pt. I describes aircraft measuremen of temperature and frost point between 20,000 and 39,000 ft on 3 flights. Tephigrams a drawn. Frost points about −80°F. were found near 38,000 ft with air temperature abou −60°F. It was found that Dobson-Brewer frost point hygrometer can be operated in th tropics. In Pt. II ground measurements of direct solar radiation, reflected short-wav atmospheric and ground long-wave radiation are briefly summarized. *Subject Heading* **1. Upper air observations 2. Radiation measurements 3. Khartoum, Sudan.**—*C.E.P.B.*

5.10–39 551.506.7:629.1

Rohan, P. K., **The utilization of aircraft reports at the Meteorological Office, Shanno Airport.** *Eire. Meteorological Service, Technical Note*, No. 11, **1952.** 10 p. 3 charts (fold. **DWB**—The immediate, subsequent and long-term use of aircraft weather reports is outline Origin, distribution and form of such reports are discussed. The methods used at the airpo meteorological office in plotting the reports on flight progress charts, upper air charts an charts showing vertical cross-sections, (Shannon, Ireland to Stephensville, Nfd.) are explaine and illustrated by a sample chart for each of the three types. *Subject Headings:* **1. Airplan observations 2. Shannon Airport, Ireland.**—*G.T.*

5.10–40 551.506.7(5

*India. Meteorological Dept., **Upper air data, Part A, Monthly means of pilot balloo data.** Last issue recd. v. 16, **1943,** pub. 1948. almost entirely tables. Monthly means previous years have appeared in the following publications: To end of 1919, in *India. M Dept., Memoirs*, v. 23, pt. 3, 1922; for 1920, *India. Met. Dept., Monthly Weather Revie* of that year; for 1921–1927, in *India. Met. Dept., India Weather Reviews*, issues for tho years; for 1928–1935, in *India. Met. Dept., Upper air data, Part 13*, 1928–1935; for 1936 in *India. Met. Dept., Upper air data, Pt. A*, 1936–. **DWB, DLC.** Also: India. Meteorologic Dept., **Upper air data, Part B, Sounding balloon and aeroplane data.** Last issue recd. v. 1 **1943,** pub. 1953. almost entirely tables. Data of upper air temperatures and humiditi obtained from sounding balloon ascents in India since 1925 have appeared in these departmenta publications: for 1925, in *India. Met. Dept., Memoirs*, v. 25, Pt. 5, 1930; for 1926–1927, *India. Met. Dept., India. Weather Reviews*, 1926–1927; for 1928–1935, in *India. M Dept. Upper air data, Pt. 14*, vols. 1–8, 1928–1935; for 1936–, in *India. M*

Dept. Upper air data, Pt. B, 1936–. **DWB, DLC**—Contains three parts (1) monthly mean directions and velocities of winds up to 9 km; (2) at and above 10 km and (3) late night ascents made at 58 stations in India, neighboring islands and states of the Persian Gulf. Actual sounding balloon data for 5 stations in India are included in the 1943 edition: (1) Bogra, (2) Calcutta, (3) Jacobabad, (4) Jamshedpur, (5) New Delhi. Monthly means of airplane meteorograph data for Calcutta and Chitagong are also given. In addition to values of pressure, temperature and relative humidity given for standard levels, the height, pressure and temperature are given for standard isobaric surfaces, and similar data for the tropopause wherever it is encountered. *Subject Headings:* **1. Upper air data 2. Tropopause data 3. Balloon soundings 4. India.**—*M.R.*

5.10–41 551.506.7:551.510.52/3(54)

*Krishna Rao, P. R. and Ganesan, V. (*Regional Met. Center, Madras*), **Characteristics of the upper troposphere, tropopause and the lower stratosphere over Trivandrum.** *Indian Journal of Meteorology and Geophysics*, Delhi, 4(3):193–204, July **1953.** 6 figs., 6 tables, 10 refs. **MH-BH**—During 1951, 62 radiosonde ascents made at Trivandrum (lat. 8°29′N) at the southern tip of India reached the 100 mb level and 10 of these reached the tropopause. Complete data are given for these ascents and for other ascents made from 1948–51. The temperature, air density and wind data are given by months or seasons and compared with similar (or sounding balloon) data for other stations in India or in Arabia, Africa, etc. in the same latitudes. Tropopauses are analyzed according to type and data given for lapse rates above the tropopause at Trivandrum. The lowest tropopause and highest temperature at tropopause occurs in N. summer (June–Oct.). Easterly winds are predominant at most levels. *Subject Headings:* **1. Tropopause data 2. Tropopause types 3. Upper air temperature data 4. Upper air density data 5. Trivandrum, India.**—*M.R.*

5.10–42 551.506.7(52)

*Matsumoto, Seiichi; Itoo, Hiroshi and Arakawa, Akio (*Met. Res. Inst., Tokyo*), **On the monthly mean distribution of temperature, wind and relative humidity of the atmosphere over Japan from March 1951 to February 1952.** *Meteorological Society of Japan, Journal*, 2nd Ser., 31(7):248–258, July **1953.** 4 figs., 11 refs. **MH-BH**—The monthly mean vertical cross sections drawn throughout a year show seasonal variations of the tropical, middle latitude and polar tropopauses in the middle latitudes. Mean geostrophic jet streams which are found between two tropopauses are associated with relatively dry areas under them. *Subject Headings:* **1. Upper air data 2. Cross section charts 3. Tropopause variations 4. Jet stream 5. Japan.**—*Authors' abstract.*

5.10–43 551.506.7(261,492)

*Netherlands. Meteorologisch Instituut, **Upper air data,** v. 35 and 36, **1950** and **1951.** *Netherlands. Meteorologisch Instituut, No. 106A*, both pub. 1952. 2 pieces. entirely tables. **DWB**—Complete radiosonde and upper wind observation data tabulated for De Bilt, Holland, and for Atlantic Weather Ships at station A ("Cumulus"), T ("Cumulus" and "Cirrus") and K ("Cumulus") for designated periods during 1950. The temperature, humidity, height and wind direction and speed are given for the standard pressure surfaces and significant points. (*See* 3.11–48, Nov. 1952, *MAB* for similar publication for 1945/46 and 1947–48.) *Subject Headings:* **1. Radiosonde data 2. Marine meteorological data 3. Upper air wind data 4. Atlantic Weather Ships 5. De Bilt, Netherlands.**—*M.R.*

5.10–44 551.506.7:518.3:621.396.8

Swingle, Donald M., **Nomograms for the computation of tropospheric refractive index.** *Institute of Radio Engineers, Proceedings*, 41(3):385–391, March **1953.** 3 figs., foot-refs., 5 eqs. **DLC**—Three sets of nomograms permitting calculation of tropospheric refractive index gradient are presented. So far as is known, no similar charts have been made for discontinuity and gradient calculations. All three have been designed about the standard radiosonde transmission, which gives temperature, dew-point temperature, and pressure at points where discontinuities occur in the vertical gradients of temperature or dew-point

temperature. These nomograms are valid for all wavelengths greater than 1.5 cm. *Subj Headings:* **1. Refraction of electromagnetic waves 2. Upper air data 3. Nomograms.** *Author's abstract.*

5.10–45 551.506

Sakai, Y. and Kawahara, R., **The forecast of the first flowering date of the cherry-blosso in Tokyo.** *Japan. Central Meteorological Observatory, Tokyo, Memoir of Industrial Meteo ology*, 16(1):65–70, Aug. **1952.** tables, graphs. In Japanese; English summary p. 4. **MI BH**—First flowering dates of the cherry blossom as recorded at the Central Meteorologic Observatory of Japan during 21 years from 1925 to 1951 (excluding 6 years from 1944 to 194 are analyzed. Average daily mean temperature and minimum temperature from Feb. March are found to be the primary meteorological factors affecting first flowering date. T forecasting formulas are suggested, based on temperature data to the end of Feb. and March 15th, respectively. *Subject Heading:* **1. Phenology.**—*From authors' abstract.*

5.10–46 551.50

Schrödter, H., **Weitere Untersuchungen über die Anwendung der Temperatursumme regel auf phänologische Phasen. Beziehungen zwischen Basistemperatur und vorläufig Startpunkt. Anwendung auf die Voraussage des Termins der Winterroggenernte.** [Furtl investigations of the application of the temperature summation rule to phenological phas Relations between the basic temperature and starting point. Application to forecasting t date of the rye harvest.] *Angewandte Meteorologie*, 2(2):59–64, **1954.** 3 figs., 5 tables, 3 re **MH-BH**—In an expression developed earlier (*see item* 4.6–39, June 1953, *MAB*) the start date affects the calculated basic temperature, as is shown by examples. The deduction o basic temperature from a hyperbola is only a mathematical abstraction and a more ex method of calculating date of harvest is given, based on summation of temperature above 0 after flowering. Rules for forecasting harvest date are described. *Subject Headings:* **1. Ph nology 2. Agro-meteorological forecasting.**—*C.E.P.B.*

5.10–47 551.50

*Uhlig, S. (*Bad Kissingen*), **Phänologische Kreisbeschreibungen.** [Phenological servation on a county level.] *Germany. Deutscher Wetterdienst, Mitteilungen*, No. 8, C **1953.** 24 p. 10 figs., 3 tables, 7 refs. **MH-BH**—Discusses the usefulness of increasing density of a phenological network in order to select most advantageously fruit varieties w differing temperature requirements that are best suited for particular localities. This probl was investigated in the Kissingen area, where the number of observers was increased in eac the 36 subdivisions by supplementing the regular 1800 phenological observers with spe technical personnel such as horticultural advisers, etc. The special observation prog developed for the Kissingen area, the mean phenological characteristics of this area inclu phenological dates, mean monthly temperature, mean variation of plant phases for the pe 1936–1952, the phenological conditions for a single year, and mapping of phenological co tions are discussed. Data are given in tables, graphs and maps. *Subject Headings:* **1. Phe logical data 2. Phenological observations 3. Bad Kissingen, Germany.**—*I.L.D.*

5.10–48 551.506.8:6

Yoshino, M. (*Geographical Institute of Tokyo, Univ. of Education*), **Phenology of the ci flowers and their local flowering dates in North Izu Region. Pts. I and II.** *Journal of A cultural Meteorology*, 7(2):68–73, June **1952.** 3 figs., 6 tables, 11 refs. English summar 70–71 and 73. **MH-BH**—In Pt. I temporal sequence of first flowering, fall blooming falling of the flowers of citrus plants is as follows: Washington navel (*C. sinensis* Osbe Wase Unshū (an early ripe variety of *C. Unshū* Marc.), Natsudaidai (*C. Natsudaidai* Ha and Unshū (*C. Unshū* Marc.). For Washington navel the correlation coefficient between air temperature of April or of March and April and the first flowering date is −0.9; for N sudaidai, −0.4; for Wase Unshū, −0.7 and −0.8. The empirical formula for Unsh $K=-8.52T+131.39$ (K is flowering date in May; T—mean temperature of April). length of time from the first flowering date to full blooming and from full blooming to fa of flowers are both long every other year. The first flowering date depends upon soil fert

and age of tree. In the Northern Izu Peninsula, Shimoka Prefecturate citrus flowers in late April, May and early June. The mean temperature of April calculated by above formula using flowering date of 1949 and 1950 showed a deviation of 0.1°C from actual observed temperature. *Subject Headings:* **1. Phenological observations 2. Citrus fruits 3. Izu Region, Japan.**—*I.L.D.*

INSTRUMENT CARRIERS

See also: **Altocumulus castellatus,** 5.10–184; **Investigations of cumuliform cloud,** 5.10–185; **Stratocumulus cloud . . . ,** 5.10–186.

5.10–49 551.507.362:551.501.7

Boyd, R. L. F., **Rocket research in the upper atmosphere.** *Science Progress,* 42(167): 435–448, July **1954.** 4 refs. **DLC**—Brief descriptions are given of methods of investigating upper atmosphere, rocket research, problems of instrumentation, recovery of observed data and determination of rocket coordinates. Methods are summarized of measuring, up to about 100 km or more, the air pressure, density, temperature, winds and ozone concentration, and of obtaining air samples. Other observations include ion and electron density, magnetic fields, airglow, solar spectra, meteors and cosmic rays. *Subject Heading:* **1. Rocket research.**—*C.E.P.B.*

5.10–50 551.507.362:551.510.53

Dow, W. G. and Spencer, N. W., **Measurement of ambient pressure and temperature of the upper atmosphere.** Michigan. Univ. Engineering Research Institute, Contract AF 19(122)-55, Final Report, Aug. **1953.** 76 p. 30 figs., table, foot-refs. **MH-BH**—The general objective of the work under subject contract is to obtain measurements of the ambient pressure and temperature of the upper atmosphere using high-altitude rockets as research vehicles. A new method which permits an essentially point-by-point determination of ambient temperature from measured pressure values has been developed and utilized experimentally. Resulting upper-atmosphere data are presented. The equipment necessary to implement the theoretical method has been developed. The alphatron ionization gage constitutes the basic pressure-sensitive device, and provides the basis for a pressure measurement system that will measure gas pressures in the range 760 mm Hg to 10^{-3} mm Hg. Associated equipment utilizing a gyroscope to allow determination of missile angle of attack, and many accessory pieces of equipment, less spectacular but necessary to the experiment, have been developed. This report reviews that portion of the research which was conducted under subject contract. *Subject Headings:* **1. Rocket measurements 2. Pressure measurements in stratosphere 4. Upper air temperature data. I. Michigan. Univ. Engineering Research Institute II. Contract AF 19(122)-55.**—*Authors' abstract.*

5.10–51 551.507.362

Oklahoma Agricultural and Mechanical College. Research Foundation, **Operation and evaluation of the beacon triangulation system and the ionosphere beacon system.** Contract W28-099 ac-376, Final Report (pub. after May **1952**). 16 p. **DWB**—This final report of a project started in Sept. 1947 is a summary of difficulties developed during the tracing of V-2 rockets and aerobees for upper air research. Lack of personnel, inadequate direction antennas, and poor synchronization of the clocks at the triangulation stations were the main problems. The best solution would be to replace all four indicators with automatic synchronization and photograph the records at one interrogator station. *Subject Headings:* **1. Rocket soundings 2. Upper atmosphere research 3. Rocket tracking. I. Contract W28-099ac-376 II. Harrington, H. E.**—*A.A.*

5.10–52 551.507.362:551.510.53

Sicinski, H. S.; Spencer, N. W. and Dow, W. G. (*Michigan Univ.*), **Rocket measurements of upper atmosphere and pressure in the 30- to 75-kilometer region.** *Journal of Applied Physics,* N. Y., 25(2):161–168, Feb. **1954.** 12 figs., 14 refs. **DWB**—A method for determining ambient temperature and ambient pressure in the upper atmosphere is described, using the properties of a supersonic flow field surrounding a right circular cone. The underlying funda-

mentals stem from basic aerodynamic principles as combined with the developments of the aerodynamics of supersonic cones by G. I. Taylor, J. W. Maccoll and A. H. Stone. The experiment provides the necessary cone pressures, velocities and Eulerian angles, such that a Mach number characterizing the ambient space conditions may be computed. A description is given of the requisite experimental equipment and related techniques. Experimental data from two rocket-borne equipments are presented with the resulting calculated pressures and temperatures as experienced over New Mexico to approximately 70 kilometers. *Subject Headings:* **1. Rocket observation techniques 2. Upper atmosphere research.**—*Authors' abstract.*

INSTRUMENTS

See also: **Met. instr.** (Middleton, Spielhaus), 5.10–6; **Turbulent temp. fluctuations** (McDonald), 5.10–23; **Elect. conductivity of air** (Pluvinage, Stahl), 5.10-224; **Studies in atmos. electricity** (Holzer), 5.10–225.

5.10–53 551.508.21

Selowe, W. (*Harvard Univ., Cambridge, Mass.*), **A DC comparison radiometer.** *Review of Scientific Instruments*, Lancaster, Pa., 25(2):120–122, Feb. **1954.** 6 figs., 11 refs. **DWB**—A DC comparison radiometer for measuring radiation from astronomical sources and their atmospheric absorption is described. This instrument has 3 db greater sensitivity than the switching-type radiometer which serves a similar purpose. Circuit diagrams of both instruments and detector output diagrams are presented. *Subject Headings:* **1. Radiometers 2. Atmospheric absorption measurement.**—*G.T.*

5.10–54 551.508.2

Stoll, Alice M. (*Dept. of Physiology, Cornell Univ., Medical College, New York*), **A wide-range thermistor radiometer for the measurement of skin temperature and environmental radiant temperature.** *Review of Scientific Instruments*, Lancaster, Pa., 25(2):184–187, Feb. **1954.** 3 figs., 7 refs. **DWB**—The thermistor radiometer consists of a Wheatstone bridge formed of four thermistors, two of which are exposed to incident radiation and two of which are hidden from it and act as thermal compensators. The instrument has been used successfully in (1) the measurement of skin temperatures indoors at normal room temperature and outdoors in ambient temperatures as low as −45°C; and (2) the measurement of the radiant temperature of the sky and ground in temperate and in arctic climates. *Subject Headings:* **1. Radiometers 2. Temperature measurement 3. Skin temperatures.**—*From author's abstract.*

5.10–55 551.508.25:546.29

Brode, Wallace R.; Gould, John H. and Wyman, George M. (*National Bureau of Standards, Wash., D. C.*), **The effect of a helium atmosphere on the Beckman infrared spectrometer.** *Optical Society of America, Journal*, 43(11):969–970, Nov. **1953.** fig., 2 tables, foot-refs. **DWB**—Displacement of the air from the optical path of a Beckman IR2T spectrometer by helium was found to result in an increase in the current of the Nernst glower and a displacement of the wavelength calibration of the instrument. The former was attributable to the greater thermal conductivity of helium, while the latter resulted from its lower index of refraction. It was found possible to evaluate the refractive index of other gases from the observed displacements in the wavelength calibration of the instrument. *Subject Headings:* **1. Helium atmospheres 2. Infrared spectrometers.**—*Authors' abstract.*

5.10–56 551.508.2

Heckert, Lothar, **Zur Frage der Brauchbarkeit der Assmann-Thermometer für die üblichen Temperatur- und Feuchtemessungen auf Grund empirischer Trägheitsbestimmungen** [The applicability of the Assmann-thermometer for the usual temperature and humidity measurement on the basis of empirical lag determination.] *Zeitschrift für Meteorologie*, 7(9):250–268, Sept. **1953.** 7 figs., 5 tables, 5 refs. **MH-BH**—The Assmann thermometer is not considered as suitable for routine synoptic temperature and humidity measurements due to its small lag and insufficient damping of turbulent temperature variations in addition to the

fferent adjustment time for the dry bulb and the wet bulb thermometer, which has faster djustment in all cases. The adjustment curves are treated according to Newton's cooling w. *Subject Headings:* **1. Assmann thermometer 2. Temperature measurements 3. Ther-ometer lag.**—*A.A.*

5.10–57 551.508.29:551.508.91:551.464

Dorrestein, R., **Een registrerende electrische zoutgehalte- en temperatuurmeter voor ebruik op zee.** [An electric recording salinity and temperature meter for use at sea.] (In: ederlands. (K.) Meteorologisch Instituut, **1854 Koninklijk Nederlands Meteorologische stituut, 1954.** 'S-Gravenhage, **1954.** p. 387–402. 3 figs., 9 refs., eqs.) **DWB**—An strument is described which can record continuously salinity or temperature of sea water. ne section of the apparatus is lowered into the sea from a ship, and is connected by a multiple-onnector cable with the recording section aboard the ship. The determination of salinity is ccomplished by measuring the electrical conductivity of the sea water flowing through a ibe with electrodes in the under water section. By means of a small thermistor which is ounted near the tube, the influence of temperature on sea water conductivity is electrically mpensated. *Subject Headings:* **1. Salinity instruments 2. Salinity measurement 3. Water mperature instruments.**—*Author's abstract.*

5.10–58 551.508.29:536.53

Elnesr, M. K., **Suppression de l'effet électrochimique dans les couples thermoélectriques estinés aux mesures météorologiques.** [Elimination of the electrochemical effect in electric hermocouples for meteorological measurements.] *Annales de Géophysique*, 10(1):64, Jan./ larch **1954. MH-BH**—In electric thermocouples measuring temperature gradient an ndesirable secondary current frequently falsifies the results. After careful experimenting a ecial welding procedure was worked out for joining the metal pieces together. This was und to eliminate the hitherto prevailing error almost completely. *Subject Headings:* **1. Ther-ocouples 2. Micrometeorological temperature measurement.**—*G.T.*

5.10–59 551.508.51

Kamamoto, Hiroo (*Met. Instrument Plant, Tokyo*), **D.C. self synchronous-motor used as ind direction meter.** *Meteorological Society of Japan, Journal*, 2nd Ser., 31(4):139–150, pril **1953.** 16 figs., 18 eqs. In Japanese; English summary p. 139. **MH-BH**—If we wind coil so that it is uniformly distributed along the core the error of transmission angle will e reduced to about ±3°. This warrants the usefulness of a D.C. self-synchronous motor as a ind direction meter. If an alloy of constant permeability is used as a core (for instance, ust core) the error will be reduced to half the above. *Subject Heading:* **1. Wind instruments.** —*Author's abstract.*

5.10–60 551.508.59:531.787

Long, R. A. K., **An automatic micromanometer for the measurement of low air speeds.** *ournal of Scientific Instruments*, 30(12):481–482, Dec. **1953.** fig., 4 refs. **DWB**—The strument automatically measures up to 7 times a minute readings of pressure at a Pitot ead with an accuracy of ±.00005 in. of water. The setup is illustrated. Two liquids are sed, water and a mixture of petroleum ether and chlorobenzine, sp.gr. 0.95. Accuracy 0.01 /sec at 10 ft/sec or 0.005 ft/sec at 20 ft/sec. *Subject Heading:* **1. Manometers.**—*C.E.P.B.*

5.10–61 551.508.59:551.551

Miller, J. E. (*New York Univ.*), **A photographic technique for analyzing turbulent motions air.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers*, No. 0:293–303, Dec. **1952.** figs., 3 refs., eqs. **DWB**—Stereoscopic photographs of small tissue aper particles suspended in air currents were made in order to study small scale motions of the r. Statistical turbulence characteristics corresponding to Reynold's theory are computed. he velocity of a particle does not deviate much more than 1% from the air velocity. Other rors introduced by sampling and by the falling of the particles can be avoided by special bservation and computation techniques. *Subject Headings:* **1. Turbulence measurement Turbulence statistics.**—*A.A.*

5.10–62 551.508.72:581.

Raschke, K., **Ein Verfahren der Transpirationsbestimmung an Blattpunkten, Blatteil und ganzen Blättern in situ.** [An experiment in determining transpiration at leaf poin parts of leaves and whole leaves in situ.] *Naturwissenschaften*, 41(13):308, July 1, 19 fig., 3 refs. **DWB**—The leaf to be measured is placed alongside a similar one with a wat proof coating. Thermoelements measure temperature difference θ and θ' between each l and surrounding air, and radiation S, S' is measured by new microrecorders. Transpirati rate is given by $(S-S'\theta/\theta')/V(t)$, where $V(t)$ is the evaporation enthalpy. The transpirati topography of a leaf of *Canna indica* is shown. Transpiration of the whole leaf is obtained integration. *Subject Heading:* **1. Transpiration meters.**—*C.E.P.B.*

5.10–63 551.508

U. S. Signal Corps, **New weather recording device is developed by Signal Corps.** Was D. C., Information Section, Office of the Chief Signal Officer, April 5, **1948.** 1 p. Mim **DWB**—General description of a dropsonde developed at the Signal Corps Engineering L oratories at Fort Monmouth, N. J. Parachuted from B-29 aircraft the apparatus (weigh less than 10 pounds) transmits temperature, pressure and humidity data back to the airpla The instrument is used primarily where ground operations are difficult, as over the ocean a in remote locations of the Arctic. *Subject Heading:* **1. Dropsondes.**—*G.T.*

5.10–64 551.508.

Exakte Messungen in den untersten 1000 Metern der Atmosphäre. [Exact measu ments in the lowest 1000 m. of the atmosphere.] *Umschau*, 54(1):20, Jan. 1, **1954.** **DWB**—Brief account of tethered balloon meteorograph developed by P. D. LOWELL, W. H. KARINEN and D. L. RANDALL (*Nat. Bureau of Standards, J. of Research*, Paper 2381, 19 *Subject Heading:* **1. Meteorographs.**—*C.E.P.B.*

5.10–65 551.508.

Bindon, H. H., **Developments in the Canadian radiosonde.** *Royal Meteorological Soci Canadian Branch* [*Publications*], 4(5), [**1953**] unpaged. 3 figs., 7 refs. **DWB**—The ra sonde network operated by the Canadian meteorological service and the Canadian radiso used at half the stations are described. The Canadian type radiosonde is based on the Oll chronometric principle. Production and calibration problems and several technical modif tions are discussed. *Subject Headings:* **1. Radiosondes 2. Aerological networks 3. Mete logical services.**—*G.T.*

5.10–66 551.508.

Hooper, A. W., **A refrigerated pressure calibration chamber for the Canadian radioso** *Royal Meteorological Society, Canadian Branch*, [*Publications*], 4(5), [**1953**] unpaged. 2 **DWB**—Description, photograph and schematic diagram of the controlled pressure and t perature chamber used in Canada for calibrating radiosondes. The chamber is capabl handling 60 Canadian meteorographs at one time. Its range is +38°C to −60°C and 1 to 10 mb. *Subject Headings:* **1. Radiosonde calibration 2. Pressure chambers.**—*G.T.*

5.10–67 551.508.822:551.5

Jayarajan, A. P. (*Meteorological Office, Poona*), **Performance of the fan in the F- radiosonde in some sharp temperature changes in the atmosphere.** *Indian Journal of teorology and Geophysics*, 4(3):260–261, July **1953.** 4 figs. **MH-BH**—On radiosonde fli in 1951 and 1952 at Poona, peculiar tephigram curves showing abnormal inversions (a 400 mb level) followed by superadiabatic layers, were analyzed to see if the rate of rota of the ventillating fan could be responsible. The results, shown graphically, indicate in the superadiabatic layer the rate of rotation of the fan showed a sharp rise and showed g fluctuations (possibly due to turbulence or ascension rate) in the inversion layers. *Su Headings:* **1. Radiosonde errors 2. Fan-type radiosondes 3. Temperature inver 4. Poona, India.**—*M.R.*

5.10–68 551.508.822

Karlsson, K. E., **Study of the homogeneity of the European radiosonde station network as to interdiurnal variability.** *Sweden. Meteorologiska och Hydrologiska Institut. Meteorologiska Byran, Notiser och Preliminära Rapporter*, 1(2), **1953.** 8 p. 3 figs., tables, 3 refs. **DWB**—A method was worked out and used to test the homogeneity of the European radiosonde network so that individual stations which appear to be frequently erratic can be noted. All the radiosonde stations in North Africa, Greenland, the Atlantic (weatherships), Western and Central Europe were used (Jan. 1 to June 30, 1952) and those in European U.S.S.R. for April–June 1952. The 500–300 mb relative topographies were taken from the twice-daily message records. Standard deviations of the 24-hourly and 12-hourly difference in 500–300 mb topography were plotted and the stations showing the greatest deviations listed in their respective order: French stations in the Mediterranean area and other French stations showed greatest deviations. None of the British were in the list of 19 showing greatest nonhomogeneity. *Subject Headings:* **1. Radiosonde errors 2. Radiosonde network homogeneity 3. Radiosonde networks 4. Europe.**—*M.R.*

5.10–69 551.508.822

Kodaira, N., **Double lobe system rawin.** *Papers in Meteorology and Geophysics*, Tokyo, 3(2):205–212, June **1951.** 15 figs., 4 refs. **MH-BH**—A detailed description, with the aid of diagrams, of the design and construction of a "double lobe system rawin." "The minimum elevation angle without any metal net is approximately 18 degrees and the error in the elevation angle above the minimum angle is about 0.4 degrees. Results of actual flights are presented. *Subject Heading:* **1. Rawinsondes.**—*I.L.D.*

5.10–70 551.508.822

Lugeon, Jean, **Le radiogoniosondage du vent par impulsion, sans répondeur.** [Radiogoniometric sounding of wind by means of pulses, without receiver.] *Académie des Sciences, Paris, Comptes Rendus*, 236(25):2426–2428, June 22, **1953.** 2 refs. **DLC**—A new method of radiosonde ranging is described. This system eliminates the costly air-borne receiver; it is based on a single antenna and radio acting both as transmitter and receiver. This apparatus, carried by the radiosonde, alternately receives ground signals and transmits them back to the ground station. The distance of the sonde is obtained by cathode-tube measurement of the time lag between outgoing and incoming signals. The transmitter-receiver differs from an ordinary transmitter only in respect to its condensers. *Subject Headings:* **1. Radiogoniometers 2. Radiometry.**—*G.T.*

5.10–71 551.508.822:551.551

MacCready, Paul B., Jr., **Turbulence measurements by radiosonde.** California Institute of Technology, Contract Cwb-8290, [unnumbered report] Oct. 15, **1952.** 5 p. 2 figs., eqs. **DWB**—By attaching a variometer to a radiosonde a better measure of the turbulence elements of small size can be obtained than by measuring the upward velocity of the balloon relative to the air. The theory, construction and operation (including calibration) of a simple variometer is described and illustrated, and curves presented to show response of balloon to sharp edge gust, and turbulent energy measurements (with respect to turbulent wavelength) from balloon. *Subject Headings:* **1. Turbulence energy measurement 2. Radiosonde balloons 3. Variometers. I. California Institute of Technology II. Contract Cwb-8290.**—*M.R.*

5.10–72 551.508.822

Malet, L., **Étude de l'homogénéité des données aérologiques dans une partie du réseau de l'ouest de l'Europe.** [Study of the homogeneity of aerological data for a part of the West European network.] *Belgium. Institut Royal Météorologique, Publications, Ser. B.*, No. 7, **1953.** 20 p. 4 figs., 2 tables, refs. French, Flemish and English summaries p. 3. **DWB**—Statistical study based on data furnished during the summer of 1951, comparing the errors of 3 British, 3 West German, 2 French, 1 American and 1 East German regular radiosonde ascents. The errors in general increased from East to West and from North to South. Standard deviations 2.9 to 3.8°C for temperature, increasing slightly with height and 4.8 to 14 m for the contour heights, increasing with height. The standard deviation for the errors in the

relative topography 1000–500 mb was 5.0–6.9 m. *Subject Headings:* **1. Radiosonde erro 2. Western Europe.**—*A.A.*

5.10–73 551.508.82

Müller, Hans and Friese, W. (*Erlangen, Germany*), **Die Radiosonde "Graw H-48 Vergleichende Messungen zur Ermittlung der Streufehler.** [Radiosonde "Graw H-48 Comparative measurements for determination of accuracy.] *Germany. Deutscher Wette dienst, Mitteilungen*, No. 2, June **1953.** 15 p. 7 figs., 5 tables. **DWB**—A detailed technic description of the radiosonde with analysis of possible error sources. Simultaneous ascen were made in order to study the comparative random errors of the radiosonde, carefull eliminating other error sources. The average difference between two samples was 2.1 to 1 mb (decreasing with height), 0.3–0.5°C (increasing with height) and 5–4% relative humidit which was measured by the Frankenberger-hair. *Subject Headings:* **1. Radiosonde erro 2. German radiosondes.**—*A.A.*

5.10–74 551.508.822:551.508.

Mullard Ltd., London, Equipment Division, **The radarsonde.** London, Sept. 195 28 p. 10 figs., 11 photos. **GB-MO**—Development of a new instrument is described, with slant range of 100+ naut. mi obtained by a secondary radar (transponder) system. Phot show telemetering circuits, aerial system, radar console, wind, pressure, humidity and tem perature elements, range display oscillograph and wind computer. Layout of sonde roo and wiring diagrams are shown. Ground station is briefly described. *Subject Headin* **1. Radarsondes.**—*C.E.P.B.*

5.10–75 551.508.822:551.5

Patton, Richard F., **A comparison between the buzzard king winds and Taegu rawin** *U. S. Air Force, 2143D Air Weather Wing, Technical Bulletin*, No. 8:6, Jan. **1952. DWB** Comparison of 700 mb winds obtained by rawin at Taegu, Korea, with nearest reconnaissan flight winds showed (57 cases) that 33% were within 5 knots, 24% of reconnaissance observ tions gave winds 5 knots or more lighter, and 43% showed 5 knots or more stronger than rawi No conclusive explanation could be found for either type of difference. *Subject Heading* **1. Rawin errors 2. Upper air winds 3. Taegu, Korea.**—*M.R.*

5.10–76 551.508.822:551.52

Scrase, F. J., **Radiation and lag errors of the Meteorological Office radiosonde and t diurnal variation of upper air temperature.** *Great Britain. Meteorological Research Co mittee, M.R.P.*, 836, Oct. 28, **1953.** 14 p. 6 figs., 7 tables, 8 refs., 19 eqs. Mimeo. **GB-M** —Effect of heating of radiation shield of M.O. radiosonde on temperature of air reaching t thermometer element is calculated as 1°C at 5 km rising to 9°C at 25 km. This is confirm by differences in readings from ascending and descending sondes. Replacement of inn aluminium shield by white card gave some improvement; other trial modifications of t shield make little difference, and modification of the temperature element is proposed. L errors in the stratosphere are small in comparison. Up to 15 km these errors account for the observed daily range, but day-night differences exceed errors by 1.5°C at 20 km and 3 at 25 km. *Subject Headings:* **1. British radiosondes 2. Upper air temperatures.**—*C.E.P.B*

5.10–77 551.508.8

Smith, Wendel R., **The adaptation of the Canadian radiosonde to rawinsonde.** *Ro Meteorological Society, Canadian Branch*, [*Publications*], 4(5), [**1953**] unpaged. 8 figs., 4 re **DWB**—The operation of the very-high-frequency direction-finding equipment used in t Canadian meteorological service is described, including the transmitter used on the radiso to adapt it to the rawinsonde ground equipment. The transmitter has a constant car power output frequency of 403 to 405 mcs which is shifted downward by 200 kcs on radiso signal. An equally simple modification on the ground equipment merely calls for the rewir of the two existing output stages in the radiosonde channel of the receiver which thus require only three resistors instead of the dozen or more resistors and capacitors curren used. *Subject Heading:* **1. Radiosondes.**—*G.T.*

5.10–78 551.508.822

Vukmirović, D. (*Belgrade*), **Aeološka merenja radiosondama.** [Aerological measurement with radiosondes.] *Yugoslavia. Hidrometeoroška Služba, Vesnik*, 2(1):13–16, Jan./March **1953.** diagr. **DWB**—Radiosondes used in various countries are classified into several types which are briefly described. The paper includes discussion of the importance of the radiosonde as a means of aerological measurement and explanation of its principal parts. *Subject Heading:* **1. Radiosondes.**—*G.T.*

5.10–79 551.508.822

Vukmirović, D. (*Belgrade*), **Sistem uredjaja za radiosondažu na 1680 Mc.** [Radio sounding system operating on 1680 Mc.] *Yugoslavia. Hidrometeorološka Služba, Vesnik*, 2(3):101–105, July/Sept. **1953.** 6 figs., 3 refs. **DWB**—Description of technical details and operation of all units of a radio sounding system consisting of radiosonde, transmitter, electronic theodolite and ground receiver. Accuracy of data obtained is discussed. The apparatus is used in the United States to replace the 400 Mc system previously used there. *Subject Heading:* **1. Radiosondes.**—*G.T.*

5.10–80 551.508.822

Wilson, W. K., **Electric weatherman.** *Pepconian*, Wash., D. C., 1(7):6–7, May **1947.** 4 photos. **DWB**—The development of the Washington Institute of Technology radiosonde is outlined and its use described and illustrated in a popular manner. It is pointed out that "widespread use of electricity supplied by PEPCO in WIT's mass-production methods has enabled them to produce as many as 500 radiosondes per day, while at the same time reducing costs from about $30 to about $17 per instrument." Photos illustrate manufacture and operation of sondes. *Subject Headings:* **1. Radiosonde manufacture 2. Washington Institute of Technology.**—*G.T.*

5.10–81 551.508.823:551.509.58

Seki, K., **On the remote recording instrument to forecast snow disaster.** *Journal of Meteorological Research*, Tokyo, 4(11):871–877, Feb. **1953.** 9 figs., 2 tables. In Japanese; English summary p. 54. **MH-BH**—Diagrams are given of several instruments designed to give automatic warning of excess accumulation of snow. *Subject Headings:* **1. Remote recording instruments 2. Avalanche warning instruments.**—*C.E.P.B.*

5.10–82 551.508.823

Tanemura, I., **On the telemeteorograph.** *Journal of Meteorological Research*, Tokyo, 4(9):731–732, Feb. **1953.** 4 figs. In Japanese; English summary p. 45. **MH-BH**—The pens of meteorological recording instruments show certain irregularities of motion which vary according to the direction of the movement of the pen. Problems arising from such variations in the particular case of telemeteorographs are discussed. *Subject Heading:* **1. Telemeteorographs.**—*Based on author's abstract.*

5.10–83 551.508.824

Treussart, H., **French automatic weather station.** *World Meteorological Organization, WMO Bulletin*, 11(4):119–121, Oct. **1953. DWB**—A prototype of an automatic weather station to be used in out-of-the-way places by the French Meteorological Service, has been developed and was put into service at Laghouat, Algeria in July 1952, and has worked successfully since. It broadcasts each hour the pressure, relative humidity (%), temperature of air (°C), mean wind speed for 10 minutes before hour, wind direction and precipitation since last observation. Two transmitters are involved, one for daytime and one for night broadcasts, and transmission is in Morse code in international units. Broadcast, consisting of station identification and observation (repeated four times) takes two minutes each hour. The modifications introduced in the production model involve broadcasting pressure to 1/2 mb, temperature to 1/2°C and rain or storm at time of observation. Station operates from batteries with or without power for recharging, so can be used where no observer or where observer is available. *Subject Heading:* **1. Automatic weather stations.**—*M.R.*

5.10–84 551.508.85 551.510:621.396:06

Marshall, J. S. (*McGill Univ., Montreal, Ontario*), **Brussels meeting of the Joint Commission on Radio Meteorology.** *Illinois. State Water Survey Division, Bulletin*, No. 41, 1952. p. 205–206. **DWB**—Among the seven papers mentioned, the author deals particularly with Bowen's on occurrence of rain without ice crystals, for which evidence is given, and Ludham's on an explanation of the phenomena as coalescent growth and chain reaction, which lends itself to the suggestion that there is "micro turbulence" to set off the coalescence of cloud to form rain. *Subject Headings:* **1. Radio meteorology 2. Rain formation 3. Conferences.**—*W.N.*

5.10–85 551.508.98

Dogniaux, R. and Vandenborre, W., **Transformation du système de contrôle du chauffage du frigorimètre de Davos en vue d'assurer une constance suffisante de la température de la sphère.** [Change in the heat control system of the Davos frigorimeter to insure better stability of temperature on the sphere.] *Belgium. Institut Royal Météorologique, Publications, Ser. B*, No. 10, **1953.** 8 figs. **DWB**—The operation of a frigorimeter was investigated in natural conditions by means of continuous measurement of the temperature of the sphere during a prolonged period for the purpose of finding heat control units better adapted to conditions in humid and rainy climates and providing a sufficient stability of the control temperature. In the units described in this paper and installed at the Radiation Service of the R. Meteorological Institute of Belgium, the bimetallic thermometer formerly used has been replaced by either a mercury contact thermometer or a platinum resistance thermometer connected with a servo-mechanism. *Subject Heading:* **1. Davos frigorimeter.**—*Authors' abstract (trans.).*

5.10–86 551.508.98

Geselle, P. and Matzke, H., **Über ein Gerät zur Registrierung der Abkühlungsgrösse** [Instrument for recording cooling power.] *Zeitschrift für Meteorologie*, Berlin, 7(9):282–286, Sept. **1953.** 3 figs., 9 refs. **MH-BH**—A Davos frigorimeter was combined with an automatic recorder obtaining hourly totals of cooling power. Rapid changes of cooling power within the given hour can be also detected. An excellent performance over about 5 years was observed. The same equipment can be used also for the recording of totals or means over a given time interval for almost all climatological elements. *Subject Headings:* **1. Automatic recorders 2. Cooling power measurement 3. Davos frigorimeter 4. Greifswald, Germany.**—*A.A.*

SYNOPTIC ANALYSIS AND FORECASTING

See also: **Baur's forecasting method** (Oosawa), 5.10–8; **Trade wind and tropical air current** (Otani), 5.10–9; **Remote recording instruments** (Seki), 5.10–81; **Statistical study of rainfall duration frequency** (Ramabhadran), 5.10–187.

5.10–87 551.509:519.2

Barton, Manes (*Oregon State College, Agr. Exp. Station*), **Systematized regression forecasting method.** *Western Snow Conference, 21st, Boise, Idaho, April* **1953,** *Proceedings*, p. 24–29. forms, 2 refs., eqs. **DWB**—Proposes standardized forms and mathematical methods for the current recomputation of regression relationships as soon as new data come in. As an example, the forecasting of springtime runoff for the Rogue River is discussed. *Subject Headings:* **1. Statistical techniques 2. Correlation theory 3. Runoff forecasting 4. Rogue River, Oregon.**—*A.A.*

5.10–88 551.509.2

Owens, James C. (*U. S. W. B. Airport Station, Cleveland*), **Discussion on probing the surface and 500 mb levels in the United States.** Cleveland, U. S. Weather Bureau, Dec. **1953.** 10 p. diagr. Typescript. **DWB**—Practical notes for preparing 36-hour surface and 500 mb prognostic charts from current 500–1000 mb thickness charts. *Subject Headings:* **1. Prognostic chart preparation 2. Thickness charts (500–1000 mb).**—*M.R.*

5.10–89 551.509.312:681.14

Sutton, O. G., **Conference on high-speed computing.** *Meteorological Magazine*, London, (985):193–195, July **1954. MH-BH**—Account of a conference on application of high-speed computing to meteorology and oceanography in May 1954. Contributions were made by G. Sutton on history, P. D. Thompson on integration of equations of large-scale non-barotrophic motions, J. Charney on progress at the Institute for Advanced Study, Princeton and the necessity for using more than two levels, and others. *Subject Headings:* **1. Mathematical forecasting 2. Electronic computers.**—*C.E.P.B.*

5.10–90 51(02) 551.509.312

Sutton, O. G., **Mathematics in action.** London, Bell, **1954.** 226 p. 52 figs., eqs. **DLC**—This book explains in a very lucid way the use of mathematics in applied science. Chapters 1 and 2 set out the principles of the mathematical solution of problems in physics. The following chapters deal with the mathematics of ballistics, wave motion and flight. Chap. 6 is an elementary introduction to statistical methods and Chap. 7, "Mathematics and the Weather," describes the dynamics of the atmosphere and its possible application to weather forecasting. Some more advanced mathematical definitions and processes are set out in the appendix. *Subject Headings:* **1. Mathematical forecasting 2. Statistical methods 3. Applied mathematics.**—*C.E.P.B.*

5.10–91 551.509.33:519.24

Kobayashi, T. and Hori, J. (*Inst. of Low Temperature Science, Hokkaido Univ.*), **Application of Wiener's theory of prediction to the problem of long period forecasting (1).** *Meteorological Society of Japan, Journal*, 2nd Ser., 31(7):259–269, July **1953.** 3 figs., 2 tables, 10 refs. 4 eqs. **MH-BH**—Wiener's method is briefly outlined and a somewhat modified formula is given, which is convenient for practical computations. By using these formulas and the method of smoothing the spectrum developed by Bartlett, a number of predicted values of the monthly mean temperature was calculated for Sapporo on the basis of (a) a series obtained by subtracting from an observed series the trends whose periods are comparable with or longer than the length of analyzed intervals (>24 months) and (b) a series representing the trend with smallest period (24 months). The results appear to indicate that, although Wiener's theory is proved to be entirely correct and can be used effectively in forecasting trends for the distant future, it does not yield satisfactory results in forecasting a comparatively near future (order of a few months). This is due to the large amount of completely random factors. *Subject Headings:* **1. Statistical forecasting 2. Long range forecasting.**—*From authors' abstract.*

5.10–92 551.509.33:519.24

Manohin, V. (*Ljubljana, Yugoslavia*), **Die Verwendung statistischer Zusammenhänge für Langfristprognosen.** [The application of statistical relationships to long range forecasting.] *Wetter und Leben*, Vienna, (5/7):128–130, Aug. **1953.** fig., 2 tables. **MH-BH**—The method consists of testing the deviation of the May, June and July precipitation from the 100-year period for each year (N) of the interval 1926–53 and aligning the value for each year with the deviation of Sept., Oct. and Nov. from the 100 year normal for the year N-4 for the period 1922–1949. With the values of the difference a−b symmetry points are established. The use of this technique for forecasting precipitation in Ljubljana is illustrated. *Subject Headings:* **1. Statistical techniques 2. Long range forecasting 3. Ljubljana, Yugoslavia.**—*I.L.D.*

5.10–93 551.509.5:551.515.8(758)

U. S. Weather Bureau, **On forecasting the southward movement of summer cold fronts into Georgia.** Atlanta Aviation Forecasters, June **1953.** 2 p. chart. **DWB**—All cases of east-west oriented cold fronts which passed Washington, D. C. before passing Nashville, Tenn. during years 1945–1952 are listed. If a front produced a drop of 8° or more in temperature at Augusta during the 48 hours following its passage at Washington, D. C., it was considered as having reached Georgia. Composite 700 mb maps were made of 4 cases of the above type and of 4 cases of fronts passing Washington but not Augusta and the two charts compared to see if any forecast parameters could be derived therefrom. It was found that the 700 mb temperature at Caribou, Maine and the height-difference Omaha–Pittsburg (a measure of strength

of northerly winds advecting the cold air southward) were the most important parameter
A scatter diagram was constructed and a line drawn separating cases when front passed Augusta
from those that did not. Out of 64 cases in 8 seasons, an accuracy of 91% was realized. *Sub*
ject Headings: **1. Cold front forecasting 2. Objective forecasting 3. Augusta, Georgia.**—*M.*

5.10–94 551.509.54:551.5

Day, Stanley (*U. S. W. B. Airport Station, Miami, Fla.*), **Horizontal convergence and th**
occurrence of summer precipitation at Miami, Florida. *Monthly Weather Review*, 81(6):153
161, June **1953.** 7 figs., 5 refs. **MH-BH**—Convergences at Miami during June to Aug
1951 are computed on the basis of a triangle of pilot balloon stations applying the Bellan
nomograph. The diurnal variation of convergence, shown for wet and dry days at differe
levels is explained by the sea-breeze effect. The results are compared with a similar stud
made over central Florida. Relating partial and total convergence to the occurrence
precipitation, no valid forecast rules could be found. This may be due to the short test perio
Subject Headings: **1. Convergence 2. Precipitation forecasting 3. Florida.**—*A.A.*

5.10–95 551.509.

Libuit, Modesto O., **An application of statistics to rain forecasting.** *Philippines. Weath*
Bureau, The Elements, 3(3):5–7, March **1952. DWB**—A formula for computing the pro
ability of rain occurrence at Manila International Airport for 24-hour periods (beginning at 7
is suggested. The factors used are: 1) east-west and north-south components of the wi
vector at 4000 ft 15 hours before T_0, 2) relative humidity averaged for 850, 700 and 500 m
levels (T_0—15 hrs) and 3) total amount of rainfall during the 24-hour period ending at T_0–
hours. Application of the formula is shown in a sample forecast. *Subject Headings:* **1. Ra**
forecasting 2. Statistical forecasting.—*G.T.*

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

STRUCTURE OF THE ATMOSPHERE

See also: **Characteristics of upper troposphere, tropopause . . .** (Krishna Rao, Ganesan), 5.10–41; **Conference of Joint Com. on Radio Met.** (Marshall), 5.10–84.

5.10–96 551.510.42:551.574

Hentschel, G., **Untersuchungen über eine allgemeine Verwendungsmöglichkeit d**
Kernzählers zur Bestimmung der Art des atmosphärischen Aerosols und der Grösse sein
Partikel. [Investigations of the general applicability of the nuclei counter for determini
the type of atmospheric aerosol and the size of its particles.] *Angewandte Meteorolog*
2(2):33–47, May **1954.** 7 figs., 4 tables, 13 refs. **MH-BH**—The small Scholz counter
filled to full volume of pump (5 cc) and the contents examined by stages of 1 cc. This indicat
the weight of the aerosols. The larger and smaller aerosols are examined by burning. Aeros
appears to include 2 extreme components: anthropogenous (combustion products) with ve
little loss (compare flame aerosols) and nonanthropogenous with very high loss. Loss
greater in polar than in föhn air. Room air (undisturbed and disturbed) and air inside a
outside Wernigerode are compared. *Subject Headings:* **1. Aerosols 2. Nuclei counters.**
C.E.P.B.

5.10–97 551.510.

Kalmus, Ernest H. (*Univ. of Calif., Los Alamos Scientific Lab., Los Alamos, New Mexic*
Preparation of aerosols for electron microscopy. *Journal of Applied Physics*, 25(1):87–8
Jan. **1954.** 2 figs., refs. **DWB**—A technique is described whereby fall-out particles from d
clouds, commonly called aerosols, may be prepared for observation with the electron microsco
Specimens are collected by means of various types of precipitators on molecular filters whi
are made from cellulose esters. During the process of dissolving this material in acetone, t
particles adhering to the filter are transferred to the Formvar-coated specimen screens of t
electron microscope. Losses are negligible, residual filter background is eliminated, a
particles are clearly visible for measuring. *Subject Headings:* **1. Dust collecting techniqu**
2. Aerosol measurement devices 3. Electron microscopy.—*Author's abstract.*

5.10–98 551.510.42:581

Smith, Ronald Delaine and Rooks, Roland (*Iowa City, Iowa*), **The diurnal variation of air-borne ragweed pollen as determined by a continuous recording particle sampler and implications of the study.** *Journal of Allergy*, St. Louis, 25(1):26–45, Jan. **1954.** 16 refs. **DLC**—Operation and accuracy of a volumetric pollen sampler are discussed. Data on hourly variation of airborne ragweed pollen amounts obtained by continuous recording (Aug. 7–Sept. 20, 1952, Iowa City) are presented. Effects of meteorological factors (humidity, wind, turbulence, temperature) on pollen amounts are mentioned. Suggestions for protective measures against clinically significant pollen amounts are derived from the pattern of diurnal variation determined in this study. *Subject Heading:* **1. Pollen analysis.**—*G.T.*

UPPER ATMOSPHERE—IONOSPHERE

See also: **Meas. of ambient pressure . . .** (Dow, Spencer), 5.10–50; **Rocket meas. of upper atmos . . .** (Sicinski, others), 5.10–52; **Ionosph. wind bibliographies** (Wiewall, others), 5.10–167; **Elect. conductivity of upper atmos.** (Maeda), 5.10–223.

5.10–99 551.510.535

Banerjee, S. S. and Banerjee, D. K. (*Engr. Coll., Banaras Hindu Univ.*), **Variation of horizontal gradient of ionization in the ionosphere.** *Journal of Scientific and Industrial Research, Ser. B*, 13(1):72–73, Jan. **1954.** 2 figs., table, 7 refs. **DWB**—Values of the horizontal gradient of ionization (difference per 100 km between critical frequencies for F_2 region at Banaras and at Delhi) in the morning and in the afternoon are presented for Oct. and Dec. 1952. Variations of the gradient show much wider range and higher average in the afternoon than they do in the morning. *Subject Headings:* **1. Ionospheric variations 2. F2 region 3. Ionization 4. India.**—*G.T.*

5.10–100 551.510.535:621.396.11

Bracewell, R. N.; Harwood, J. and Starker, T. W., **The ionospheric propagation of radio waves of frequency 30–65 kc/s over short distances.** *Institution of Electrical Engineers, London, Proceedings, Pt. IV*, 101(6):154–162, Feb. **1954.** 12 figs., 13 refs. [Same article, digest version], *Ibid.*, Pt. III, 101(70):108–110, March **1954,** 4 figs., 13 refs. **DLC**—The paper describes experiments carried out at Cambridge on waves of frequency 30–65 kc/s reflected from the ionosphere at steep incidence. The phases and amplitudes of two linearly polarized components of the downcoming wave were measured with reference to the ground wave. The results for frequencies of 30, 43 and 65 kc/s are considered in turn, and compared with the results for 16 kc/s. The main conclusions were as follows: (a) The day-to-day variations of the downcoming wave were greater at the higher frequencies. (b) The change of height of reflection in passing from day to night was about the same for all the frequencies. (c) In summer, the amplitude by day and by night was very different, except at 16 kc/s. (d) The polarization at all the frequencies was approximately circular, left-hand and constant. The height of reflection of waves of frequency 30 kc/s was determined by using the frequency/change method of Appleton and Barnett. *Subject Headings:* **1. Radio wave propagation 2. Ionospheric reflection.**—*Authors' abstract.*

5.10–101 551.510.535:551.594.12

Mariani, F., **Densità elettronica nell'alta atmosfera e interpretazione delle curve h′ (f) dell'altezza virtuale della ionosfera. Parte I.** [Electron density in the upper atmosphere and the interpretation of the curve h′ (f) of the virtual height of the ionosphere.] *Annali di Geofisica*, 6(1):21–45, Jan. **1953.** Pt. 2, *Ibid.*, 6(4):533–553, Oct. **1953.** 18 figs., 5 tables, 23 refs., numerous eqs. English summaries p. 44–45; 553. **DWB**—1) The group refractive index applicable to the vertical propagation of an electromagnetic wave in the ionosphere is calculated for the latitude of Rome by means of Appleton's formula. The optical path of a wave of given frequency penetrating a parabolic layer is calculated for three different heights of maximum electron density and for various values of critical frequency. The geometrical parameter of electron distribution in the ionospheric layers is determined by a theoretical revision of an experimental curve of virtual height, thus obtaining the thickness of every

layer and its height above ground, considering both the cases of total separated and of partially superimposed layers. 2) The optical path is calculated for an electromagnetic wave which penetrates and is reflected by a Chapman layer having a "semithickness" $2.5H$ (H=scale height). A comparison of the results with those obtained in Pt. I for those ionograms in which the F_1 and the "true" F_2 layers are partially superposed. The electron density distribution in the superposition region is studied considering the recombination of the electrons and the ions and it is ascertained that the model of linear superposition used in Pt. I must be replaced by a more complicated model in which the electronic density is $N=[N_1^2+N_2^2]^{\frac{1}{2}}$ (N_1 and N_2 are the densities of the F_1 and the "true" F_2 layers if they are independent). A preliminary comparison of the theoretical and experimental results seems to give a better interpretation of the ionograms. *Subject Headings:* **1. Electromagnetic waves 2. Electron density 3. Upper atmosphere.**—*From author's abstract.*

5.10–102 551.510.535

Rawer, K. (*Freiburg*), **Anomalies of region F_2.** *International Council of Scientific Unions. Mixed Commission on Ionosphere, 2nd Meeting, Brussels, Sept.* **1950,** *Proceedings*, Pub. 1951, p. 140–144. 2 figs., 9 refs. **DWB**—Geographical and time-of-day variations in the characteristics of the F_2 layer are discussed from the point of view of symmetry or similarity within the various regions of the Northern Hemisphere (for convenience in broadcasting predictions). It is found that Europe is more likely to be homogeneous with Asia and Africa than with America, as lines tend to be parallel to latitude lines within the two main continental masses, with the discontinuities falling somewhere in the Atlantic and Pacific. The equatorial effect for the period 1943–48 shows a marked influence of the sunspot cycle, increasing from 1944–47, with symmetry neither about the magnetic nor the geographic equator, whereas the daily maximum of critical frequency foF_2 for 1947–48 shows symmetry around the magnetic equator (no solar influence). *Subject Heading:* **1. F2 anomalies.**—*M.R.*

5.10–103 551.510.535

Uyeda, H. (*Radio Regulatory Commission of Japan*), **On worldwide distribution of foF_2.** *International Council of Scientific Unions. Mixed Commission on Ionosphere, 2nd Meeting, Brussels, Sept.* **1950,** *Proceedings*, p. 138–140. **DWB**—Brief summary of general features of foF_2, which is distributed according to the geomagnetic latitude, and the anomalies are symmetrical with the 0° and 180° meridians, with minima in the polar regions near 90° and 270° geomagnetic longitude. Maps were constructed on the basis of all data from 1934–1947 and the seasonal variations for 1945–47. *Subject Headings:* **1. F2 critical frequency anomalies 2. F2 distribution.**—*M.R.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

See also: **Horizontal convergence and summer precip. at Miami, Fla.** (Day), 5.10–94; **Meas. of sun radiation intensity . . .** (Słomka), 5.10–133.

5.10–104 551.511:551.55

Frankenberger, E. F. H. (*Hamburg, Germany*), **Investigations of the vertical exchange within the lowest decameters at Quickborn.** *U. S. Air Force. Cambridge Research Center Geophysical Research Papers*, No. 19:323–343, Dec. **1952.** figs., 12 refs., eqs. **DWB**—Vertical profiles of temperature, moisture and total heat content were computed from the vertical dry- and wet-bulb temperature gradients measured on a radio tower. Up to a certain height, depending on convection, the data were in agreement with Lettau's turbulence theory. Apparent differences between the vertical exchange coefficient of momentum and of heat observed above 12 m are explained by convection. The fine structure of temperature variations was studied. *Subject Headings:* **1. Atmospheric turbulence 2. Turbulent exchange 3. Turbulence measurement.**—*A.A.*

5.10–105 551.51

Frost, R. (*Met. Office, London*), **A power law representation of the heat transfer in the lowest 100 meters of the atmosphere.** *Tellus*, Stockholm, 5(4):513–528, Nov. **1953.**

tables, refs., eqs. **MH-BH**—On the assumption that the flux of heat in the air is governed by an interchange coefficient which can be represented by a simple power law of the height above the surface, that the flux of heat in the ground is by molecular processes and that during the daylight hours the variation of temperature can be represented by a sine function, the phase angle of the diurnal temperature wave is calculated and is shown to be in good agreement with observations. The phase angle of the annual temperature wave is also discussed. Calculations of K_H the coefficient of eddy conductivity of heat and of its mode of variation with height in unstable conditions suggest that it is approximately equal to K_M the coefficient of eddy viscosity. *Subject Headings:* **1. Heat transfer 2. Heat conductivity coefficient.**—*Author's abstract.*

5.10–106 551.511:551.551

Lettau, Heinz, **Notes on the transformation of mechanical energy from and to eddying motion.** *Journal of Meteorology*, 11(3):196–201, June **1954.** table, 15 refs., 45 eqs. **MH-BH**—The equations of mechanical energy of total, mean and eddying motions are derived and discussed. It is shown that, in general, no term of these equations can directly be interpreted as representing the rate of transformation of mechanical energy of mean motion to mechanical energy of the eddying motion. Observational evidence is discussed, showing that the prominent energy transformations in the atmospheric boundary layer stem from the work done by the pressure-gradient force and from the viscous dissipation of energy. The eddy flux of energy of the mean motion and the divergence of this flux act as an intermediary agent between the prominent sources and sinks of energy. A characteristic of the atmosphere is the possibility of "kinetic-energy cycles," or two-way conversions in which the disturbance can feed into the energy of the mean motion, in contrast to the "energy cascade" from mean to eddy energy of wind-tunnel turbulence. *Subject Heading:* **1. Eddy diffusion.**—*Author's abstract.*

5.10–107 551.511

Öpik, E. J. (*Armagh Observatory*), **Convective transfer in the problem of climate.** *Dublin Institute for Advanced Studies. School of Cosmic Physics, Geophysical Bulletin*, No. 8, Oct. **1953.** 14 p. 2 tables, 5 refs., 17 eqs. Price: 3s6d. **DLC, DWB**—Formulae are given for the convective transfer of heat in a vertical direction in free thermal convection by allowing for lateral exchange and by introducing the concept of a dimensionless coefficient of contact transfer $f=0.1$. These formulae represent experimental data within 20 to 30%, whereas the usual "mixing-length" approximation overestimates the transfer by a factor of about 30. Similar formulae are given for the forced transfer in a steady-gradient atmosphere, caused by aerodynamic turbulence. Here the "mixing-length" approximation is somewhat better, yielding transfer figures which are too large by a factor of only about 3. Formulae are derived for the convective transfer along the earth's surface, by analogy with the above-mentioned simpler cases but using empirically determined local coefficients of proportionality. The variation of local mean temperature depending upon insolation is determined. The formulae are applied to the problem of fluctuations of mean annual and seasonal temperatures, depending upon the variations of the orbital elements of the earth. The fluctuations are found to be too small to account for the repeated advance and retreat of glaciation during the ice ages. *Subject Headings:* **1. Convective heat exchange 2. Mixing length 3. Temperature variations 4. Atmospheric turbulence.**—*Author's abstract.*

GENERAL CIRCULATION

See also: **Abnormalities of spring** (Ludlum), 5.10–35.

5.10–108 551.513

Arakawa, H. (*Met. Res. Inst., Suginami-ku, Tokyo*), **Critical study on the angular-momentum-transfer method and vorticity-transfer method in the investigation of zonal circulation of the atmosphere.** *Meteorological Society of Japan, Journal*, 2nd Ser., 31(4):132–138, April **1953.** table, 3 refs., 11 eqs. **MH-BH**—A comparative and critical study of the angular-momentum-transfer and vorticity-transfer methods for investigating zonal circulation is given. The essential difference between the two methods is that the fluctuations of atmospheric pressure in the west-east direction (which certainly exist in a turbulent field of flow) are ignored

in the former method, while in the latter they are taken into account. According to the former method the displaced particle moving toward the pole gains the west component of wind speed and the displaced particle moving toward the equator loses it, while according to the latter method the displaced particle moving either north or southward usually gains the west component of wind speed. Very high velocities will result when a mass is moved horizontally from a given latitude toward the pole or equator under conservation of its angular momentum, while quite reasonable velocities will result when a mass is moved horizontally under conservation of its absolute vorticity. *Subject Heading:* **1. Zonal circulation.**—*Author's abstract.*

5.10–109 551.513(265

Estoque, Mariano A., **Air streams over the tropical Northwestern Pacific during the typhoon season.** Condensed by M. O. Libuit from unpublished paper: **Circulation and convergence over the tropical Northwestern Pacific from May to December.** *Philippines Weather Bureau, The Elements*, 3(5):5–6, May **1952. DWB**—Mechanisms and characteristics of (1) the North Pacific trades, (2) the Indian southwesterlies, (3) the South Pacific trades and (4) the northeast monsoon are described and weather phenomena usually associated with them indicated. During the typhoon season (May–Dec.) these four streams prevail in the Tropical Northwestern Pacific. *Subject Headings:* **1. Circulation patterns 2. Western Pacific. I. Libuit, M. O.**—*G.T.*

5.10–110 551.513:551.51

Kuo, Hsiao-Lan (*Massachusetts Institute of Technology*), **On the production of mean zonal currents in the atmosphere by large disturbances.** *Tellus*, Stockholm, 5(4):475–493, Nov. **1953.** 10 figs., 12 refs., 8 eqs. **MH-BH**—The problem of the production of mean zonal currents by large-scale horizontal disturbances in the atmosphere is attacked by computation of time-tendencies from the vorticity equation. It is shown that the earth's rotation, acting through the variable Coriolis parameter, generally produces a mean northward transport of westerly momentum, with the maximum transport occurring south of the middle of the zonal belt occupied by the disturbances, and therefore creating mean westerly and easterly currents in the central and outer parts, respectively. Its effect on the disturbance may either be a damping or an amplification, depending on the asymmetry of the mean flow profile. Six different mean flow profiles have been investigated to determine the nature of the interaction between a disturbance and the mean flow. For three profiles with inflection points, the interaction depends upon the wave length of the disturbance. If the wave length is longer than a critical value, an amplifying effect on the disturbance is produced accompanied by a divergence of westerly momentum in the region of maximum mean flow, and if shorter, a damping effect with a convergence of westerly momentum. On the other hand, the interaction produces only a damping effect for three mean flow profiles without inflection point. Since the zonal currents in the atmosphere are seldom very strong and not far from symmetrical, the total effect of the earth's rotation and of the mean flow leads to horizontal damping, in which the contrast in the mean flow at different latitudes is increased and a mean northward transport of westerly momentum is produced. This is in qualitative agreement with observations, indicating that these factors are of real importance in the development and maintenance of the mean zonal flow. *Subject Headings:* **1. Atmospheric disturbances 2. Zonal currents 3. Earth's rotation 4. Zonal perturbations.**—*Author's abstract.*

5.10–111 551.513:551.542(02

***Tables, diagrams and charts for 1952.** *South Africa. Weather Bureau, Notos*, 2(3):183–252, **1953.** entirely tables, diagrs. and charts. **DWB**—Extensive tabular data representing the basic Southern Hemisphere circulation data for June to Aug. 1952, as derived from daily Southern Hemisphere surface and 500 mb weather maps prepared by the South Africa Weather Bureau, are listed directly from the punched cards and sea level, 500 mb height and 1000–500 mb thickness charts (mean monthly and mean seasonal charts are presented). In addition time diagrams for selected zonal and meridional indices are given for June, July and Aug. 1952. Data and 2 color charts are for ocean as well as land areas around the globe from 10°N–90°S. *Subject Headings:* **1. Synoptic data 2. Southern Hemisphere Project (South Africa) 3. Mean monthly pressure charts 4. Southern Hemisphere.**—*M.R.*

5.10–112 551.513(68)

Taljaard, J. J., **The mean circulation in the lower troposphere over Southern Africa.** *South African Geographical Journal*, v. 35:33–45, Dec. **1953.** 14 refs. **DWB**—Charts showing summer and winter streamlines of the wind at 2, 4 and 6 km above sea-level over Southern Africa are presented. These charts are preliminary, being based upon observations published in the form of frequency tables or wind roses only. Charts showing the pressure distribution at sea-level over the surrounding oceans and at 1250 geopotential meters over the Union, Bechuanaland and South West Africa are included. It is shown that the anticyclonic center over east of Transvaal at 2 kilometers is displaced rapidly to central or northern South West Africa at 4 and 6 km. in both seasons, while the high pressure axis is about 4 to 8 degrees nearer the equator in winter. The Intertropical Convergence Zone is indicated at 2 and 4 km in summer, stretching from northern Madagascar westwards to the Zambesi valley. Another zone of convergence between equatorial air from the Congo and tropical air from South Africa stretches from the Zambesi valley in a westerly direction across southern Angola. In winter an almost uninterrupted easterly to southeasterly airstream exists at all levels to the north of the high pressure axis. A col is indicated over the Mozambique Channel or Madagascar in summer and winter. "Constancy indices" have been entered on the maps for the South African area. *Subject Headings:* **1. General circulation 2. Circulation pattern 3. South Africa.**—*Author's abstract.*

5.10–113 551.513.4

Jílek, Josef, **Chod četností cirkulačních typů ve střední Evropě.** [Variation of frequencies of circulation types in Central Europe.] *Meteorologické Zprávy*, 6(2):60–62, May **1953.** 2 figs., table.—Tables and graphs of monthly frequencies of various circulation types (zonal, northern, northeastern, meridional and mixed type) and of anticyclonic curvature are presented. Particular attention is paid to the frequencies for May–June and Nov.–Dec. These are worked out in 3-day smoothed curves and discussed in detail. Weather singularities of these months (as referred to in weather lore) are examined in connection with the circulation types predominant around the critical days. A possible explanation and confirmation is found for each of the weather maxims considered. *Subject Headings:* **1. Circulation type frequencies 2. Weather lore 3. Singularities 4. Central Europe.**—*G. T.*

ATMOSPHERIC DISTURBANCES

See also: **Trade wind and tropical air current** (Otani), 5.10–9; **Cold front forecasting** (U. S. Weather Bureau), 5.10–93; **Production of mean zonal currents in atmos . . .** (Kuo), 5.10–110.

5.10–114 551.515.2:551.465

Rodewald, Martin, **Bericht über einen zyklonischen Monsun-Sturm im Golf von Bengalen.** [Report on a cyclonic monsoon storm in the Bay of Bengal.] *Wetterlotse*, No. 30/31:1–10, Nov. **1951.** 2 figs. **DWB**—Describes cyclone of July 19–25, 1951, as experienced on the M.S. Mai Rickmers," which passed through the "eye." The conflict of wind and current is discussed. *Subject Headings:* **1. Tropical cyclones 2. Bay of Bengal.**—*C.E.P.B.*

5.10–115 551.515.2(263)

Rodewald, Martin, **Nachtrag zum Hurrikan "Carol."** [Supplement to hurricane "Carol."] *Wetterlotse*, 63/64:234–240, Nov./Dec. **1953.** 2 figs. **DWB**—Further account of hurricane of Sept. 1, 1953 as experienced by a ship in 14°37'N, 48°44'W. Curves of pressure and air temperature are reproduced. *Subject Headings:* **1. Hurricanes 2. Hurricane "Carol" (Sept. 1953) 3. Tropical Atlantic.**—*C.E.P.B.*

5.10–116 551.515.2

Rodewald, Martin, **Der Hurrikan "Able" von 1951.** [Hurricane "Able" of 1951.] *Wetterlotse*, No. 57:113–116, May **1953.** 2 figs. **DWB**—Forming in mid-May, this was the earliest known hurricane in western N. Atlantic and the only one in May to reach full hurricane intensity. It followed a looped track east of U. S. A. May 15–24. *Subject Headings:* **1. Hurricanes 2. Hurricane "Able" (1951) 3. North Atlantic.**—*C.E.P.B.*

5.10–117 551.515.

Abdullah, Abdul J., **A proposed mechanism for the development of the eye of a hurrican** *Journal of Meteorology*, 11(3):189–195, June **1954.** 5 figs., 11 refs., 24 eqs. **MH-BH**—T *incipient stage* consists of air converging to a sink below and diverging above, forming a sim vortex. The *immature phase* is the approach to a steady form with subcritical and supercriti rings and eye into which lower air cannot penetrate. *Mature phase* develops when unstal waves at upper surface of supercritical region develop into spiral hydraulic jumps with t bulent motion. This and friction cause loss of energy and flow into the eye, and a new eq librium with a core of solid rotation. Quasi-circular white bands on the radarscope a attributed to vibration at this stage. When the supercritical region is annihilated the jum disappear and *decay* sets in. These developments are set out mathematically with a numeri example. *Subject Headings:* **1. Hurricane structure 2. Eye of hurricane.**—*C.E.P.B.*

5.10–118 551.515.21:551.515.3(

Syoono, S.; Ogura, Y.; Gambo, K. and Kasahara, A. (*Geophysical Inst., Tokyo Uni* **On the negative vorticity in a typhoon,** *Meteorological Society of Japan, Journal*, Ser. 2, 29(1 397–415, Dec. **1951.** 28 figs., refs., eqs. English summary p. 397. **MH-BH**—Analysis the fine structure of typhoons revealed small convective cells of about 50–100 km in diame with positive and negative vorticity embedded in the large vortex. Drawings show t distribution of vorticity at different levels and their connection with the intensity of ra fall. A formula is given for the quantitative distribution of "vortical rains." The theory oscillations within these small vortex cells in outlined. *Subject Headings:* **1. Typhoon structu 2. Vortexes 3. Japan.**—*A.A.*

5.10–119 551.515

Yoshitake, M. (*Centr. Met. Obs., Tokyo*), **On the dynamics of open systems and its plication to the motion of typhoons.** *Geophysical Magazine, Tokyo*, 24(4):193–207, Ma **1953.** 6 figs., 3 tables, 2 refs., 25 eqs. **MH-BH**—The forces governing the motion of tropi storms are theoretically analyzed according to the concept of the motion of open systems, i assuming that the same particles do not always remain in a fixed region about the center c vortex. The equation of motion of open systems is derived. It is found that the princi forces governing the motion of tropical storms, viz., the Coriolis force and the horizon pressure force are almost in balance with each other, thus providing the physical mean for the concept of steering current. Other major and minor forces involved are defin *Subject Headings:* **1. Energy equations 2. Dynamics of the atmosphere 3. Typhoon m chanics.**—*From author's abstract.*

5.10–120 551.515.23(9

Balagot, Virgilio F. (*Meteorologist, Legaspi City, Philippines*), **Passage of Typhoon T at Legaspi City.** *Philippines. Weather Bureau, The Elements*, 3(11):15–17, Nov./D **1952. DWB**—Approach and passage of a typhoon over Legaspi City as reflected in inst mental and visual observations at the station are described in a chronological account. phoon "Trix" is referred to as "one of the most destructive if not the most destructive typh that ever hit the Philippines," with around 550 casualties (most of them due to drowni and material damage amounting to an estimated 100,000,000 pesos. *Subject Headin* **1. Typhoons 2. Typhoon "Trix" (1952) 3. Philippine Islands.**—*G.T.*

5.10–121 551.515.4(

Jackson, S. P., **Autographic weather records during a thunderstorm in South Afr** *South African Geographical Journal*, 35:26–27, Dec. **1953.** diagr., 3 refs. **DWB**—A diag reproducing autographic records of wind direction and velocity, pressure, temperature, d point and rainfall for a 24-hour period in which a thunderstorm moved through Kimber S.A. is presented and commented on. The records are believed to represent features wh would characterize a typical thunderstorm of that region. Sudden fall of temperature a sudden rise of pressure accompanying the squall are mentioned as such typical featu *Subject Headings:* **1. Thunderstorms 2. Kimberley, South Africa.**—*G.T.*

5.10–122 551.515.4(68)

*Le Roux, J. J., **The distribution of thunderstorms and thunderstorm development over the Union of South Africa.** *South Africa. Weather Bureau, Notos*, 2(4):263–269, **1953.** figs., 7 tables. **DWB**—Tables give the average monthly number of days with thunder heard for the period 1940–45, covering the Cape Province (41 stations), Orange Free State (6), Natal (7), Transvaal (17), Bechunaland (2), S.W. Africa (4). Only stations with reliable observations were selected. Maps show the annual and seasonal distribution. The maximum occurs northwest from Durban. The diurnal and seasonal variations are given and some synoptic processes are briefly discussed. *Subject Headings:* **1. Thunderstorm frequencies 2. Climatic charts 3. South Africa.**—*A.A.*

5.10–123 551.515.4:551.571(437)

Rein, František, **Poznámky ke vztahu tlaku par k bouřkám.** [Note on the relation between vapor pressure and thunderstorms.] *Meteorologické Zprávy*, 6(2):40–43, May **1953.** figs., 6 refs. **MH-BH**—The correlation between surface vapor pressure and the probability of thunderstorm occurrence is graphically investigated for Prague, České Budějovice, Milešovka and Lomnický Štít, Czechoslovakia. It is found that there is a direct relationship between vapor pressure value and thunderstorm occurrence within a limited area and on a single day. The correlation is closer in high and in dry locations than it is in low and in humid ones. Forecasters are reminded to use the vapor pressure value for thunderstorm forecasts only within the same day and to take into consideration a possible modifying effect of frontal passages. *Subject Headings:* **1. Thunderstorm forecasting 2. Vapor pressure 3. Czechoslovakia.**—*G.T.*

RADIATION AND TEMPERATURE

RADIATION

See also: **U. V. radiation** (Koller), 5.10–5; **Aircraft and surface met. observations, Khartoum** (Goldsmith), 5.10–38; **Description of atomic photometer . . .** (Baillet, others), 5.10–55.

5.10–124 551.521.1:621.47

Ghai, M. L.; Khanna, Mohan Lal; Ahluwalia, J. S. and Suri, S. P. (*Nat. Phys. Lab. of India, New Delhi*), **Performance of reflector-type direct solar cooker.** *Journal of Scientific and Industrial Research*, 12(12):540–551, Dec. **1953.** 16 figs., 5 tables, 7 refs., 11 eqs. **DWB**—Apparatus and methods of measurement used in performance tests of reflector-type solar cookers are described. Fifty of these tests were made in order to determine the effect of variations in different meteorological factors (insolation, dust, wind, etc.) on the performance of cookers. Heating curves are presented for several weather types. *Subject Heading:* **1. Solar cookers.**—*G.T.*

5.10–125 551.521.1:621.47

Löf, George O. G. and Nevens, Thomas D. (*Denver Research Inst., Univ. of Denver*), **Heating of air by solar energy.** *Ohio Journal of Science*, Columbus, 53(5):272–280, Sept. **1953.** 5 figs., 5 refs. **DLC**—A residential heating system utilizing heat supplied by a solar energy collector is described and illustrated. The collector consists essentially of an arrangement of glass plates (single strength window glass) coated with black heat absorbing surface. Heat recovery curves are presented. *Subject Heading:* **1. Solar heating.**—*G.T.*

5.10–126 551.521.1

*Sauberer, Franz, **Die Sonnenstrahlung auf eine horizontale Fläche an Punkten mit überhöhtem Horizont (Mittelwerte bei wolkenlosem Himmel für Österreich).** [Solar radiation on a horizontal surface at places with elevated horizon (Averages during cloudless sky in Austria).] *Wetter und Leben*, 5(5/7):130–134, Aug. **1953.** 4 tables, 2 refs. **MH-BH**—Data are given for (1) the intensity (in cal/cm²) of solar radiation upon a horizontal surface under conditions of clear sky expressed as average hourly values for the 15th of each month

at elevations of 200, 500, 1000, 1600, 2000 and 3000 m; (2) time of average sunrise and suns for Austria at localities with elevated horizon (mean local time for the 15th of each month (3) for determining the loss of solar radiation upon a horizontal surface as a result of belat sunrise and early sunset and (4) total solar radiation upon a horizontal surface in valleys a depressions with different horizontal screening. *Subject Headings:* **1. Solar radiation da 2. Solar radiation intensity 3. Austria.**—*I.L.D.*

5.10–127 551.521.1:621.

Shaw, John H. (*Dept. of Physics and Astronomy, Ohio State Univ., Columbus*), **Solar radi tion.** *Ohio Journal of Science*, Columbus, 53(5):258–271, Sept. **1953.** 5 figs., 5 tables, 3 re **DLC**—Problems of solar energy utilization are summed up. The paper includes discussi (with general data) of the sun and solar radiation, atmospheric absorption, scattering, a sorption by clouds, available energy of solar radiation, energy variation with solar altitud methods of utilizing solar energy and efficiency of solar radiation machines. *Subject Headi* **1. Solar energy utilization.**—*G.T.*

5.10–128 551.521.12(

*Georgii, Walter, **Messungen der Intensität der Sonnenstrahlung in Argentinien.** [Me urements of the intensity of solar radiation in the Argentine.] *Meteorologische Rundsch* 6(9/10):161–174, Sept./Oct. **1953.** 19 figs., 17 tables, 12 refs. **DLC**—Observations up 6.5 km were made with a Michelson-Büttner actinometer in flights over Argentina and co pared with ground observations at 24–3840 m. The diurnal variation at ground station discussed in relation to those of temperature, humidity and wind at surface and their variat with height, including an analysis of the circulation in the mountains. Extreme values radiation are related to synoptic situations. Spectral distribution of radiation with vari air mass thicknesses is discussed and losses by water vapor and haze analyzed. Radiation Argentina is so clearly related to aerology that such observations should be an integral p of it. *Subject Headings:* **1. Solar radiation measurements 2. Argentina.**—*C.E.P.B.*

5.10–129 551.521

*Xanthakis, John, **Sur une relation entre les valeurs moyenned mensuelles de la radiat solaire observée en 12 stations de l'hemisphere Nord.** [The relation between the mont average values of solar radiation observed in twelve stations of the Northern Hemisphe *Akademia Athēnōn, Praktika*, 26:208–218, **1951.** fig., tables. In French; Greek summ p. 210–211. **DWB**—The author shows that the relationship $r' = S_1/S'_{13-i}$ of mean mont values of solar radiation for 12 specified stations is equal to the radius vector of an elli whose oscillation and eccentricity change from place to place. $S_i, i = 1, 2 \ldots 6$ are m monthly values of solar radiation for Jan.–June, S_{13-i} similar values for Dec.–July $\frac{S_1}{S_{13-i}} = \frac{P'}{1 - e' \cos(L_i - w')}$, $i = 1, 2 \ldots 6$ (L_i-solar longitude, P, e and w are constants). D are given for Parc-St. Maur (1925–29), mean total daily radiation at Locarno-Monti, Zu and Davos and weekly means of daily totals of solar and sky radiation on a horizontal face for various stations in the United States. *Subject Headings:* **1. Solar radiation 2. Northern Hemisphere.**—*I.L.D.*

5.10–130 551.52

Lopukhin, E. A., **Dnevnoe estestvennoe osveshchenie v Tashkente.** [Natural dayl in Tashkent.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofizicheskaia*, No. 5:469–473, 1 4 figs., 3 tables, 6 refs. **DLC**—Investigation of the natural illumination during da in Tashkent was made using the Veber-Bylov photometer. Observations were m before and after noon, and at noontime. Illumination by sunlight, by scattered light total is given in table for the heights of sun 5°, 10°, 20°, 30°, 40°, 50° and 60°. Data of served maximum and minimum of total and scattered light are supplemented with chara istics of sky and surface conditions. The graphs show the isopleths of illumination for hour and each month. *Subject Headings:* **1. Daylight illumination 2. Scattering of 3. Tashkent, U.S.S.R.**—*N.T.Z.*

5.10–131 551.521.3 · 551.521.1

Dirmhirn, Inge, **Sonnen- und Himmelsstrahlung während einer Schönwetterperiode.** [Solar radiation and sky radiation during a period of good weather.] *Wetter und Leben*, Vienna, 5(5/7):125–127, Aug. **1953.** fig., table. **MH-BH**—The effect of the aging of an air mass upon the radiation components is investigated with special reference to a period of fine weather in Vienna. It was observed that the daily totals of sun and global radiation increase linearly with increasing wind velocity, and totals of sky radiation diminish linearly with increasing wind velocity. The intensity of the radiation components on clear days in a large city is related to the presence or absence of air contaminants. The meteorological effect of aging of an air mass is less important than this effect of air pollution which depends upon wind velocity and air renewal. *Subject Headings:* **1. Solar radiation 2. Sky radiation 3. Air mass effects 4. Atmospheric pollution effects.**—*I.L.D.*

5.10–132 551.521.31

Hopkinson, R. G. (*Dept. of Sci. and Ind. Research, Building Research Station, Garston, Eng.*), **Measurements of sky luminance distribution at Stockholm.** *Optical Society of America, Journal*, 44(6):455–459, June **1954.** 11 figs., 7 refs. **DLC**—Measurements of the distribution of sky luminance have been made at Stockholm. The fully overcast sky appears to have the same luminance distribution in the latitude of Stockholm (60°N approximately) as it has in the latitude of London (50°N approximately), Washington, D. C. (40°N approximately), and elsewhere. It would therefore appear that the Moon and Spencer formula for the luminance distribution of the completely overcast sky can be taken to apply to northern latitudes. The blue-sky brightness distribution agrees with other similar measurements and with a formula derived from first principles by G. Pokrowski, but less well with Pokrowski's own modified formula which he adjusted to agree with measurements made in Moscow. *Subject Headings:* **1. Sky brightness measurement 2. Stockholm, Sweden.**—*Author's abstract.*

5.10–133 551.521.31:551.510.42

Słomka, Jan, **Kilka uwag dawnych pomiarach natezenia promienio wania slonecznego we Wroclawiu i w okolicy.** [Some remarks on previous measurements of intensity of solar radiation at Wroclaw and its vicinity.] *Czasopismo Geograficzne*, Wroclaw, 21/22(68):474–475, **1952.** 6 refs. **DLC**—After having pointed out the fact that the air of large cities is polluted by dust and water vapor condensed on dust particles which cause a decrease of intensity of solar and atmosphere radiation, the author presents a description of the location and equipment of the recently (1946) organized Meteorological Observatory of Wroclaw University and Polytechnical Institute and forewarns that data obtained there will be inferior to the ones obtained beyond the city limits. This assumption is confirmed by examples and results of actinometric investigations carried out in 1929–1932 at Wroclaw and its suburbs, as well as in London in 1881–1885 and 1931–1935. *Subject Headings:* **1. Solar radiation intensity 2. Atmospheric pollution effects 3. Wroclaw, Poland.**—*A.M.P.*

5.10–134 551.521.63:551.593

Sekihara, Kyo (*Met. Res. Inst., Tokyo*), **On a relation between the distribution of ultraviolet sky radiation and the optical thickness of the atmosphere.** *Meteorological Society of Japan, Journal*, 2nd Ser., 31(4):117–124, April **1953.** 5 figs., 4 tables, 11 refs. In Japanese; English summary p. 117. **MH-BH**—In connection with numerical calculations based on a theoretical formula of primary and secondary Rayleigh scattering in a plane-stratified atmosphere of uniform composition, the influence of the variation of total scattering coefficient of the atmosphere on the angular distribution of the intensity of ultraviolet sky radiation in the sun's vertical plane is investigated for zenithal angles 30 and 60°. Taking the intensity at zenith as a unit, the relative intensities at varying zenith angle are computed and compared with observed values of C. Dorno and F. Lindholm or O. Eckel. The theoretical conclusion, that relative intensities at a comparatively large angle (especially 60°) increase with decreasing optical thickness of the atmosphere, is found to be confirmed by results of observations at both angles of the sun's elevation. *Subject Headings:* **1. Ultraviolet radiation 2. Sky radiation 3. Atmospheric optics.**—*Author's abstract.*

AIR TEMPERATURE

See also: **Turbulent temp. fluctuations** (McDonald), 5.10–23; **Calculation of temp. of air layer near ground** (Gutman), 5.10–26; **Fan type radiosonde** (Jayarajan), 5.10–67; **Upper air temps.** (Scrase), 5.10–76; **Intensity of evaporation from lakes . . .** (Skibniewski), 5.10–172; **Sunspot effects on temp.** (Hanzlík), 5.10–217.

5.10–135 551.524.2(73):519.2

*Lenhard, Robert W. and Baum, Werner A., **Some considerations on normal monthl temperatures.** Florida. State Univ. Dept. of Meteorology, Contract NONR-988(01) Project NR 082 071, (Report), March 15, **1954.** 16 p. 3 figs., 5 tables, 12 refs. **DWB** The concept of a satisfactory normal monthly temperature is examined. January and Ju mean temperature records at seven stations in the United States are examined. It is foun that, except in the western United States in summer, such temperature records may be accepte as constituting a random sample. It is also found that, in general, mean monthly temperature are not normally distributed. The method of confidence limits is applied to determinatio of a satisfactory normal temperature. Seasonal and geographical variation in reliability normal temperatures is observed. Consideration is given to the adequacy with which th normal characterizes the temperature record, and to the influence of trends and cyclic fluctu tions on this adequacy. It is suggested that a normal of desired reliability be computed fro the most recent portion of the record to be most representative. Normals computed b different methods are compared and show a statistically significant difference in July onl a difference that may be of no practical importance. *Subject Headings:* **1. Statistics in m teorology 2. Temperature normals. I. Florida. State Univ. Dept. of Meteorolo II. Contract NONR-988(01).**—*Authors' abstract.*

5.10–136 551.524.32:551.588.

Xanthakis, John, **A correlation between the coefficient of continentality and the eccen tricity of the ellipse of the mean monthly air temperatures in the temperate zones.** *Akadem Athēnōn, Praktika*, 27:101–106, **1952.** 9 figs., ref. In English; Greek summary p. 105–10 Abstracted from reprint. **DLC, DWB**—Shows that there exists a correlation between t coefficient of continentality (c) and the eccentricity (e) of the annual course of temperature defined in a previous paper, if c is above 32% (*A. M. S., Bull.*, 29(10):550–552, 1948). Belo 32% almost no relation was found. *Subject Headings:* **1. Annual temperature variatio 2. Continentality 3. Correlation coefficients.**—*A.A.*

5.10–137 551.524.

*Xanthakis, John, **New relations between the mean monthly air temperatures.** The saloniki, University, Dept. of Astronomy, **1953.** 27 p. numerous tables. 12 figs., re **DWB**—A statistical analysis of monthly mean temperatures for successive periods of 10 11 years (corresponding to sunspot cycles) for Vienna, Copenhagen, Edinburgh, Rome, Berg and New York from 1765–1774 (for Copenhagen and Edinburgh) to 1934–1944 for all stations in order to determine the relationships (and their physical cause and significanc between temperature differences from winter to summer, or between equinoxes (spring and fa and the resulting asymmetry of the annual temperature curves. The relation between the parameters and the longitude of the sun over the centuries is clearly shown in graphical for and the complete data for each station for each period (from one sunspot minimum to the ne set forth in tables. *Subject Headings:* **1. Temperature relationships 2. Sunspot cycl 3. Long period records 4. Statistical studies.**—*M.R.*

5.10–138 551.524.36:523

*Visser, S. W., **De periode van 27 dagen.** [The 27-day period.] (In: Netherlan (K.) Meteorologisch Instituut, **1854 Koninklijk Nederlands Meteorologisch Instituut, 19** 'S-Gravenhage, **1954.** p. 365–386. 6 tables, 6 figs., 10 refs.) **DWB**—A short descripti of the heat waves in the summer of 1947 and their connection with the sun's rotation is giv in ¶ 1 and ¶ 2. In ¶ 3 a short account of the Buys Ballot and Abbot periods is given. and ¶ 6 and Tables I–IV contain the results of an investigation of the above connection in years 1947–1953 (up to August). The investigation of long sequences of temperature-extre

nd their relation to the annual sunspot numbers has been extended to the 43 years 1910–1952. he results are given in ¶ 8 and in figure 2. The extremely high sunspot maximum of 1778 roduced disappointing results (¶ 9). The spreading out of the heat waves over Western urope is illustrated by figures 3–6 (¶ 10). There are indications that analogous phenomena re found on the west coasts of the United States of America (¶ 11). Probably the phenomena iscussed in this paper are caused by some activity in the ionosphere. *Subject Headings:* **. Heat waves 2. Sun's rotation 3. Sunspot numbers.**—*Author's abstract.*

SOIL TEMPERATURES

See also: **Limnology of Vienna streams** (Inst. of Sci. and Art, Vienna), 5.10–3; **Calculat. of temp. of air layer near ground** (Gutman), 5.10–26.

5.10–139 551.525.5:025.33 551.588.5

U. S. Library of Congress. Technical Information Division, [**SIPRE**] **List of subject eadings.** 3d ed. Issued for the Snow, Ice and Permafrost Research Establishment, Corps f Engineers, Wilmette, Illinois. Wash., D. C., Oct. **1952.** 41 p. Note: Supersedes the Dec. 1951 publications. **DLC**—Among the more than 1500 subject headings used in the now, Ice and Permafrost Bibliography those of interest to meteorologists include anemometers, ir pressure, albedo, artificial precipitation, atmosphere, climatology, crystals, frost action, laciers, hygrometers, ice, meteorological instruments, meteorology, permafrost, precipitation, sychrometry, pyranometers, radiation meters, snow, snow cover, snow gages, soil temperature, ublimation and many others. Also subdivisions of the above and geographical headings ead to more specific location. *Subject Headings:* **1. Snow, ice and permafrost subject headings. . U. S. Snow, Ice and Permafrost Research Establishment.** —*M.R.*

5.10–140 551.525.5

Redozubov, D. B., **Thermal field laws of the permafrost in the Vorkuta region.** Translation by Leonid Stambul-Sheik and Jaroslav Jan Peel from the orig. Russian in *Akademiia Nauk SSSR. Institut Merzlotovedeniia im. V. A. Obrucheva*, Vol. 1, **1946.** *U. S. Snow, Ice and Permafrost Research Establishment, Translation*, No. 17, Feb. **1954.** 20 p. 9 tables, 12 figs., 9 refs. **DLC**—General laws governing the thermal field in permafrost are developed nd applied to the dynamics of the freezing process in the Vorkuta region. Temperature urves computed theoretically are compared with curves of temperature measured in mine hafts to a depth of 160 m. It is found that a slow rising of the lower boundary of the permafrost (at present at 131 m) is taking place and the thermal field of the permafrost undergoes slow change, while the climate does not change. *Subject Headings:* **1. Permafrost changes . Vorkuta Region, USSR. I. Stambul-Sheik, Leonid** (*trans.*) **II. Peel, Jaroslav Jan** (*trans.*). —*G.T.*

PRESSURE AND WIND

PRESSURE

5.10–141 551.541:551.579.5

Meissner, R. (*Institut für Meteorologie u. Geophysik, Frankfurt Univ.*), **Der Einfluss von uftdruckschwankungen auf den Grundwasserstand.** [Effect of atmospheric pressure scillations on ground water level.] *Zeitschrift für Geophysik, Sonderband*, Brunswick, p. 161–80, **1953.** 12 figs., 15 refs., eqs.—The observed ground water level is a surface where the tmospheric pressure in the well equals the air pressure in the porosities of the soil. Exact urrent records of the water level in a well at Frankfurt University show a definite relation to ressure. A theory is developed which allows computation of the air pressure in the soil epending on periodic oscillations of the atmospheric pressure, introducing a mean effective orosity. *Subject Headings:* **1. Soil air pressure 2. Ground water oscillations.**—*A.A.*

5.10–142 551.542

Verploegh, G., **Een merkwaardige gemiddelde luchtdrukverdeling voor de kust van omaliland.** [A remarkable mean air pressure distribution on the coast of Somaliland.]

(In: Netherlands. (K.) Meteorologisch Instituut, **1854 Koninklijk Nederlands Meteorologisch Instituut, 1954.** 'S-Gravenhage, **1954.** p. 403–418. 5 figs., table, 3 refs. **DWB**—In connection with the preparation of a new climatological atlas of the Indian Ocean, th analysis of the monthly mean pressure charts revealed a remarkable mean pressure distributio off the Somali coast during the Southwest monsoon season. Its main characteristic is ridge of relatively high pressure just off the coast followed by a long trough parallel to th coastline. Though the pressure differences are only small, about 1–2 mb, the whole system very persistent and appears on the charts from June up to and including October. *Subje Headings:* **1. Pressure distribution 2. Somaliland.**—*Author's abstract.*

5.10–143 551.543:551.54

*§Bijvoet, H. C., **Enige beschouwingen over het verband tussen de luchtdrukverdelin in de bovenlucht en de luchtdrukveranderingen aan het aardoppervlak.** [Considerations o the relation between the pressure distribution in the upper atmosphere and the pressur changes.] (In: Netherlands. (K.) Meteorologisch Instituut, **1854 Koninklijk Nederland Meteorologisch Instituut, 1954.** 'S-Gravenhage, **1954.** p. 299–319. 4 figs., 2 tables, 19 refs eqs. **DWB**—The processes that cause pressure variations at ground level have been analyze in such a way that a connection could be obtained with the empirical methods used in drawin prebaratics in the weather service at De Bilt. Particular attention is given to the physic background of the empirical rules for the relation between the pressure variations at groun level and the pressure field in the upper air. In many cases it appears possible with the ai of the derived equations to bring order into the at first sight chaotic distribution of pressur tendencies on the surface weather map. *Subject Headings:* **1. Upper air pressure variation 2. Pressure changes 3. De Bilt, Netherlands.**—*Author's abstract.*

5.10–144 551.543:523.4

Kröger, H. J., **Om lufttrycksvariationerna i Helsingfors i närheten av jupiteroppos tionerna.** [Air pressure variations in Helsinki in the vicinity of the Jupiter oppositions.] *Te niska Föreningens i Finland, Förhandlingar,* 62(8,9,11):158–161, 173–182, 228–231, Aug Sept., Nov. **1942.** 19 figs., 7 refs. **DLC**—The first crude evidence of planetary influence o weather conditions is presented and discussed. The regular variations of the planet Jupit in its opposite position in relation to the sun, as seen from the earth, are measurable and ma be utilized in forecasting according to the author. Many examples are given. *Subject Hea ings:* **1. Planetary influences 2. Pressure variations 3. Jupiter 4. Helsinki, Finland.**—*W.*

TURBULENCE

See also: **Measuring structure of atmos. flow** (Edinger), 5.10–21; **Photographic technique for analyzing turbulent motions of air** (Miller), 5.10–61; **Turbulence meas. by radiosonde** (McCready), 5.10–71; **Investigats. of vertical exchange . . .** (Frankenberger), 5.10–104; **Transform. of mech. energy from and to eddying motion** (Lettau), 5.10–106.

5.10–145 551.551:533.

Cope, W. F., **The turbulent boundary layer in compressible flow** *Great Britain. Aer nautical Research Committee, Reports and Memoranda,* No. 2840, **1953.** 8 p. 2 figs., tab 6 refs., eqs. **GB-MO**—The flow of a compressible gas past a flat plate is analyzed for pow law and log law at Mach numbers 1.3 and 3.0 and the results for practical gunnery are co pared. The reduction of skin friction with increasing M differs little using the two law *Subject Heading:* **1. Turbulent flow.**—*C.E.P.B.*

5.10–146 551.551:629.13:591.

Franzisket, Ludwig, **Weshalb bilden Flugzeuge und Zugvögel Flugformationen?** [W do aircraft and migrating birds fly in formation?] *Umschau,* 54(13):399–400, July 1, 19 3 figs. **DWB**—The V-shaped formation of airplanes and large birds gives least resistan least turbulence and greatest visibility of plane or bird ahead. Small birds do not suf the same risk from turbulence and fly in a cluster. *Subject Headings:* **1. Aeronautics 2. B navigation 3. Turbulence effects.**—*C.E.P.B.*

5.10–147 551.551

Ogura, Y. and Miyakoda, K. (*Geophys. Inst. Tokyo Univ.*), **Some remarks on the "turbulent element model" of the isotropic turbulence.** *Meteorological Society of Japan, Journal,* 2nd Ser., 31(6):206–218, June **1953.** 8 figs., 9 refs., 6 eqs. **MH-BH**—Some characteristics of the model of isotropic turbulence are studied from the point of view of energy spectrum of turbulence. At first the influence of the running-mean process of the original turbulent velocity in the spectral distribution of energy is discussed. It is then demonstrated what spectral properties the "Turbulenzelement" (introduced by WEIZSÄCKER) has, and by what kind of running mean process INOUES's "turbulon model" is derived. This analysis clarifies the interrelation between the theories of the above-mentioned authors and those of other authors regarding isotropic turbulence. Furthermore, the well-known "-5/3 power law" of the energy spectrum is again derived by means of the equation of energy balance, which is somewhat different in form from those of OBUKHOV and HEISENBERG. *Subject Heading:* **1. Turbulence theory.**—*Authors' abstract.*

5.10–148 551.551

Starr, Victor P. (*Mass. Inst. of Technology*), **Note concerning the nature of the large-scale eddies in the atmosphere.** *Tellus,* Stockholm, 5(4):494–498, Nov. **1953.** fig., refs. **MH-BH**—The rate of generation of kinetic energy of mean zonal motions by the large-scale horizontal eddies in the atmosphere is computed from three independent sets of hemispheric wind data. The results are larger than certain analogous dissipation estimates would require. Meteorological implications of the material are discussed. *Subject Heading:* **1. Large scale eddies.**—*Author's abstract.*

5.10–149 551.551

Taylor, R. J. (*Commonwealth Sci. and Ind. Res. Organization, Melbourne*), **Locally isotropic turbulence in the lower layers of the atmosphere.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers,* No. 19:231–239, Dec. **1952.** figs., table, 5 refs. **DWB**—Eight records of turbulent wind fluctuations made by hot wire anemometers and extended over 5 minutes each, show that the mean square of the difference between the value of the wind component at an instant and that after t seconds is proportional to t with the power 1 up to the order of the ratio m/m. sec. (height of observation/mean wind speed). This result supports the assumption of local isotropic turbulence, according to Kolmogorov's similarity hypothesis. LIN points out in the discussion that the power 2/3 might apply as well in accordance with Taylor's concept. *Subject Headings:* **1. Isotropic turbulence 2. Wind fluctuations 3. Kolmogorov's similarity hypothesis. I. Lin, C. C.**—*A.A.*

5.10–150 551.551:533.16

Yerg, Donald G., **The elementary theory of viscosity and related phenomena in the higher atmosphere.** Pennsylvania. State College. Ionosphere Research Laboratory, Contract AF 19(122)-44, Scientific Report, No. 45, April 25, **1953.** 64 p. 6 figs., 6 tables, 39 refs., 3 eqs. **DWB**—The laws of kinetic theory cannot describe the statistical behavior of molecules in the higher atmosphere where collisions are rare. The viscous stress must decrease as the density approached zero, assuming that the velocity profile has upper and lower limits. The region somewhat below 400 km is considered as a transition zone between classical theory and free molecule behavior, where the mean free path is approximately equal to the thickness of the circulation layer. The maximum viscous effects may occur at about 240 km. Cross-isobar wind components are discussed, suggesting a meridional structure of the general circulation. Convective cells in the ionosphere are probable. *Subject Headings:* **1. Upper atmosphere 2. Viscosity 3. Atmospheric turbulence. I. Pennsylvania. State College. Ionosphere Research Laboratory II. Contract AF 19(122)-44.**—*A.A.*

WIND

See also: **Trade wind and tropical air current** (Otani), 5.10–9.

5.10–151 551.552 551.553.11(521.73)

Fukuda, Y., **On the seasonal change of wind distribution in Himeji.** *Journal of Meteorological Research,* Tokyo, 4(9):669–673, Feb. **1953.** 13 figs., table. In Japanese; English

summary p. (41). **MH-BH**—To find out the characteristics of wind distribution in Himej simultaneous observations were made on fine days in each season. 1) The wind direction i influenced by land and sea breezes except in winter. The land breeze generally blows betwee NNE and NE, the sea breeze between S and SW, especially SW. Wind velocity is strong o the coast and north, slight in the middle part of the city. 2) The sea breeze is stronger tha the land breeze. 3) The sea breeze invades the plains, as though it were pushing up the lan breeze, 4) The evening calm is more marked than the morning calm. 5) Westerly winds chang their direction clockwise in winter when the prevailing wind is weak. On the coast westerl winds are strongest and in the north NE winds. *Subject Headings:* **1. Wind distributio 2. Land and sea breezes 3. Himeji, Japan.**—*Author's abstract.*

5.10–152 551.552 551.50

Stone, William W., Jr. and Weir, Gordon B., **The interpretation of monthly streamlin charts. 1941.** 20 p. table, 4 figs. Thesis (M.Sc.)—California Institute of Technology **DWB**—Monthly resulting north and east wind components from some 75 stations over th United States were computed at approximately 2000′ above the ground, drawing isogone and streamlines on the basis of previously constructed maps with isoboreals and isoaustrals as suggested by WERENSKIÖLD. Only the method is described, streamline charts are not given *Subject Headings:* **1. Streamline charts 2. Wind field analysis 3. United States. I. Weren skiöld, W.**—*A.A.*

5.10–153 551.552(521.72

Nakamura, H., **Stream lines of wind in Kyoto City.** *Journal of Meteorological Researc* Tokyo, 4(9):675–683, Feb. **1953.** 2 figs., 2 tables. In Japanese; English summary p. (42 **MH-BH**—On the basis of detailed wind observation carried out in Kyoto during four season stream line charts are drawn for various distributions of atmospheric pressure. The autho claims that it is possible to forecast wind direction and velocity for any locality of the city b using these streamline charts in conjunction with the general wind direction and velocit predicted from the current weather chart. *Subject Headings:* **1. Wind distribution 2. Topo graphic effects 3. Kyoto, Japan.**—*G.T.*

LAND AND SEA BREEZES

See also: **Seasonal change of wind distribut. in Hemeji** (Fukuda), 5.10–151.

5.10–154 551.553.1

Kobe. Marine Observatory and others, **The co-operative observation of land and se breeze in Hiuchi-Nada.** *Journal of Meteorological Research,* Tokyo, 4(9):649–658, Feb. 195 19 figs., 2 tables. In Japanese; English summary p. (40). **MH-BH**—Five weather statio and twenty schools joined in a project aimed at the observation of land and sea breezes. Th project involved surface observations of wind direction and velocity at 81 points and aerologic observations at 4 points. Observations were made on July 30 and 31, 1951. Stream lines observed breezes are presented along with weather charts for the two days of observatio *Subject Headings:* **1. Land and sea breezes 2. Hiuchi-nada, Japan.**—*G.T.*

5.10–155 551.553.

Vujičić, K. (*Belgrade*), **Morski i kopneni vetrovi.** [Land and sea breezes.] *Yugoslav Hidrometeorološka Služba, Vesnik,* 2(2):58–63, April/June **1953. DWB**—The mechanism land and sea breezes and their occurrence and characteristics in different parts of the wor are discussed. *Subject Heading:* **1. Land and sea breezes.**—*G.T.*

5.10–156 551.553.11(46

Ward, A., **Sea-breezes at North Front, Gibraltar.** *Great Britain. Meteorological Offi Meteorological Reports,* 2(14), **1954.** 8 p. 7 figs., 11 tables. At head of title M.O. 53 **GB-MO**—The North Front airstrip runs E–W. The sea breeze blows from south, in summ often over 15 kt for 3 hours or more (13–14 days a year May–Oct.) with gusts to 30 kt. It s in between 10 and 12 h GMT, freshens to maximum 13–15 h and dies away by 18–20 h.

rarely extends above 1000 ft. It is generally associated with a stable temperature distribution up to 900 mb, clear skies and light variable or westerly upper winds. Effect on aircraft landing is briefly discussed. *Subject Headings:* **1. Sea breezes 2. Gibraltar.**—*C.E.P.B.*

WIND EFFECTS

See also: **Roughness of air-sea boundary** (Munk), 5.10–7; **Snow drifting . . .** (Pugh), 5.10–194.

5.10–157 551.556.2:634.9

†Cadman, W. A., **Shelterbelts for Welsh hill farms.** *Great Britain. Forestry Commission, Forest Record*, No. 22, **1953.** 30 p. 9 figs., 62 refs. **DLC**—Shelterbelts are required in regions of strong wind, heavy rainfall and acid soil. The physical factors in wind reduction are shown, with diagram, and the agricultural purposes, siting and shape of belts explained with illustrations. Suitable trees for different exposures are listed. *Subject Heading:* **1. Shelter belts.**—*C.E.P.B.*

5.10–158 551.556.2:63

Luncz, Géza, **Mezővédő fápasztákkal a többtermelésért.** [Shelter belts for more production.] *Természet és Technika*, Budapest, 109(9):553–560, Sept. **1950.** 4 figs., 3 tables, 4 refs. **DLC**—This article which deals with the effect of shelter belts on soil properties, microclimate and crop yield and with problems of optimum distribution of shelter belts, includes data (from Russian sources) on wind, atmospheric humidity and crop results as modified by shelter belts. *Subject Headings:* **1. Shelter belts 2. Agricultural meteorology.**—*G.T.*

5.10–159 551.556.2:551.588.6

Mishima, Tsutsomu; Onodera, Sigeru; Masuda, Hisao and Ishikawa, Masayuki, **On the calming effect of windbreaks and on interception of fog by fog-damage-prevention-forests at Ohta-Village, Akkeshi-County.** *Tokyo. Forest Experiment Station, Bulletin*, No. 64:133–165, Oct. **1953.** 18 figs., 15 tables, 8 refs. In Japanese; English summary p. 165. **DWB**—This report is based on observations made during the period of 11 consecutive days, starting on July 10th, 1952, at Ohta-Village, Akkeshi, Hokkaido. Results obtained are summarized as follows: it has hitherto been recognized that in foggy weather, southerly and northerly winds prevail and that southerly winds have a tendency to be constantly stronger in this locality as compared with the velocity of northerly winds. The form-quotients of larch trees, suffering wind damage, tend to be smaller than that of trees of normal growth. It was further revealed that the form-quotient is an excellent indicator of the velocity of the prevailing wind. It was noted that tree tops and branches of larch trees pointed rigidly in a fixed direction which coincides with the dominant southwesterly winds of this season. In the open the wind velocity is stronger, the air temperature near the ground is higher and the fog-water trapped by gauze-method greater than in the forest. It was further revealed that the fog-water amount varied according to the wind velocity. The 90 to 100 percent line of the wind velocity is at twenty times of the tree height to leeward when the wind blows at right angle with the belt. The width of zone protected by windbreaks tends to reduce in proportion as the wind angle shifts from right to oblique. It seems that the line of interception effect of sea-fog is closer to the leeward edge of the forest as compared with the line of calming effect of the windbreaks. *Subject Headings:* **1. Windbreaks 2. Shelter belt effects 3. Wind velocity 4. Fog prevention 5. Forest influences 6. Ohta, Japan.**—*Authors' abstract.*

5.10–160 551.556.2

Roller, Kálmán, **Mezővédő erdősávok telepítése az Alföldön.** [Planting shelter belts in the Hungarian plains.] *Természet és Technika*, Budapest, 109(2):78–85, Feb. **1950.** illus., 4 refs. **DLC**—In addition to a general discussion of the effect of shelter belts on various climatic factors and of Russian and Hungarian achievements in climatic and soil improvement by means of shelter belts, the author deals with a major project involving systematic afforestation and establishment of a network of shelter belts throughout eastern Hungary. According

to the plan 5% of the protected territory would be covered with trees, according to a carefully arranged plan. A map of the east Hungarian plains shows the proposed main forest strips. *Subject Headings:* **1. Shelter belts 2. Hungary.**—*G.T.*

5.10–161 551.556.2:551.579

Sukharev, I. P., **Vodoreguliruiushchaia rol' lesnykh polos.** [The role of shelter belts on water regulation.] *Les i Step'*, Moscow, 10:22–31, **1951.** 4 tables, fig. **DLC**—Long period observations made in gulley catchment areas in Kamennaia Steppe show that the springtime runoff ratio decreases from .60 for steppe to .16 for an area with 18% forests. Observations on 10 experimental plots show similar results. Comparative infiltration data are given for the soil in a young and old shelter belt, as well as on fallow. *Subject Headings:* **1. Shelter belt effects 2. Runoff.**—*A.A.*

5.10–162 551.556.2:533.607

Tani, N. (*Natl. Inst. of Agr. Sci., Japan*), **On the mechanism and effect of shelter-hedges. Wind tunnel test of the model hedge. Pt. 1.** *Journal of Agricultural Meteorology*, Tokyo, 7(2):51–53, June **1952.** Pt. 2, *Ibid.*, 7(3/4):134–136, Nov. **1952.** 5 figs., table, 5 refs. In Japanese; English summaries p. 53, 136. **MH-BH, DWB**—The length of the effective zone of a shelter hedge is determined theoretically from known values of (a) logarithmic wind velocity distribution, (b) vertical distribution of life-time of the largest vertical eddy and (c) roughness parameter of the ground surface. Theoretical results are co-ordinated with experimental measurements made in a wind tunnel, using various types of model hedges having different roughness characteristics. The wind velocity destruction in front of and behind the hedge was measured by 12 Pitot tubes and manometers. The relation between the intensity of turbulence and turbulent Reynolds number on the wind tunnel flow and the type of wake were determined. The type of wake is constant with variable wind tunnel flow velocity and varies when the intensity of turbulence is increased by the turbulent grid. *Subject Headings:* **1. Windbreaks 2. Wind tunnel experiments.**—(*Based on author's abstracts*) *I.L.D., G.T.*

5.10–163 551.556.2

Tokyo, Japan. Forest Experiment Station, **Bulletin,** No. 56, Dec. **1952.** In Japanese. Added title-page and titles also in English. Occasional resumé in English. Bibliographic references in original language. illus., tables. **DWB**—This issue contains one long, comprehensive paper on effect of windbreaks on wind conditions to their lee, and two short papers analyzing narrower aspects of the subject. Much tabular, photographic and graphic material is included, and a long English summary of the principle article is appended. *Subject Headings:* **1. Windbreaks 2. Forest influences 3. Japan.**—*M.R.*

5.10–164 551.556.2:6

Tsuboi, Y. and Izumi, S. (*Nat. Inst. of Agr. Sc.*), **On the mechanism and effect of shelter-hedge.** *Journal of Agricultural Meteorology*, 7(2):43–44, June **1952.** 2 figs. English summary p. 44. **MH-BH**—The effect of shelter-hedges on a rice nursery is studied with the aid of the cooling rate of hot water (40°C) in vessels distributed on the ground of the nursery. The cooling rate was least to the lee of the hedge at a distance 2 or 3 times the hedge height. No effect was observed at a leeward distance more than 8 times the hedge height. The position of the minimum cooling rate is at the point where the back currents of the wind prevail. *Subject Headings:* **1. Windbreak effects 2. Rice culture.**—*I.L.D.*

UPPER AIR WINDS

See also: **Trade wind and tropical air current** (Otani), 5.10–9; **Comparison between buzzard king winds and Taegu rawins** (Patton), 5.10–75.

5.10–165 551.557:551.542

Arakawa, H. (*Met. Res. Inst. Tokyo*), **On the maintenance of westerlies and tropical revolving wind systems.** *Meteorological Society of Japan, Journal*, 2nd Ser., 31(6):195–205, June **1953.** table, 16 refs., 30 eqs. **MH-BH**—The problem of the poleward eddy flux of

angular momentum has attracted the attention of many meteorologists. This paper is devoted to the transformation of the Reynolds equation of mean motion and the Reynolds energy equation for the mean motion into the orthogonal curvilinear coordinates. In the second section the theory is illustrated by applications to cylindrical and spherical polar coordinates. In the third section the mechanism of a conversion of the eddy kinetic energy into the kinetic energy of mean zonal flow in the inter-tropical latitudes is discussed in order to illustrate the maintenance of westerlies in the middle latitudes. In the last section a conversion of the eddy kinetic energy into the kinetic energy of mean revolving motion in the storm region of typhoons is suggested. *Subject Headings:* **1. Geostrophic winds 2. General circulation 3. Typhoon mechanics 4. Kinematic analysis.**—*Author's abstract.*

5.10–166 551.557:550.385

Vestine, E. H. (*Dept. of Terrestrial Magnetism, Carnegie Inst. of Washington, Wash., D. C.*), **Winds in the upper atmosphere deduced from the dynamo theory of geomagnetic disturbance.** *Journal of Geophysical Research*, Wash., D. C., 59(1):93–128, March **1954.** 16 figs., 3 tables, 57 refs., 18 eqs. **MH-BH**—Average features of geomagnetic disturbance are represented by atmospheric-electric current-systems. These cannot be uniquely inferred from the magnetic observations at ground level. Using the Balfour Stewart dynamo theory, these electric current-systems are then tentatively replaced by equivalent atmospheric wind-systems, using order of magnetic calculations. It is found that these supposed wind-systems will differ in accordance with the degree of electric polarization of the atmosphere, and with the intensity of toroidal or solenoidal electric currents likely to be present, as a consequence of zonal winds. A simple monthly mean wind-system of geomagnetic disturbance shows good general agreement with a wind-system derived by KELLOGG and SCHILLING from meteorology. A qualitative version of a possible wind-system for the main phase of a magnetic storm is derived and found to show some measure of agreement with diurnal features of atmospheric motions deduced from radio-star scintillations and auroral motions. The causes of such wind-systems, and the effective transverse conductivity of the atmosphere, are briefly but inconclusively discussed. It is shown that the flux of X-rays producing ionization of the *E*-region is apparently the same on days of magnetic storm as on days prior to the storm, and that the dynamo air-flow at the *E*-region yielding the quiet-day diurnal variation also appears inappreciably affected by the presence of a magnetic storm. *Subject Headings:* **1. Upper air winds 2. Geomagnetic disturbances 3. Dynamo-theory of ionosphere.**—*Author's abstract.*

5.10–167 551.557:551.510.535:016

†Wiewall, Miguel, Jr.; Medina Hernández, José and García de Quevedo, José L., **Bibliography of the literature of the ionosphere pertaining to ionospheric winds.** Puerto Rico. Univ. College of Agriculture and Mechanic Arts, Mayaguez, Contract AF 19(122)-476, Scientific Report, No. 1, [**1953**]. 89 p. **DWB**—Pt. I contains abstracts of over 150 papers, published during the past 50 years, on the subject of high level winds mainly from telescopic and radio meteor trail observations, radio fading, (sporadic E-layer data), etc. Pt. II is a logical summary of the knowledge gained from these studies. An author and subject index are included. *Subject Headings:* **1. Ionospheric wind bibliographies 2. Bibliographies. I. Puerto Rico. Univ. College of Agriculture and Mechanic Arts, Mayaguez II. Contract AF 19(122)-476.**—*M.R.*

AQUEOUS VAPOR AND HYDROMETEORS

EVAPORATION

5.10–168 551.573:551.481

Lake evaporation. *Meteorological Magazine*, London, 83(960):52–56, Feb. **1954. MH-BH**—Discussion of: U. S. Navy Electronics Laboratory, San Diego, Calif., **Water-loss investigations, Vol. 1, Lake Hefner studies technical report.** *U. S. Geological Survey, Circular*, No. 229, 1952. Also issued as *U. S. Navy Electronics Lab., NEL Report*, 327, **1952.** (*See item* 5.3–13, March 1954, *MAB.*) **DWB**—Opened by E. KNIGHTING. Accurate data were used to test evaporation formulas and energy-budget method described. PENMAN, SUTTON, BLEASDALE and GOLD made various criticisms; GLASSPOOLE suggested similar studies in Britain. Some

comments by PASQUILL are included. *Subject Headings:* **1. Evaporation 2. Lake Hefner Oklahoma. I. U. S. Navy Electronics Laboratory, S. Diego, Calif. II. U. S. Weather Bureau III. U. S. Geological Survey.**—*C.E.P.B.*

5.10–169 551.573:551.579.

Ostromęçki, Jerzy, **Parowanie terenowe pszenicy na madach.** [Evaporation from wheat on loams.] *Gospodarka Wodna*, Warsaw, 13(6):205–209, June **1953.** 6 figs., 5 tables. **DLC**—A report on results of observations of evaporation from wheat plants (summer wheat) on loamy soils of various texture and with different levels of ground water. The experiments were carried out by the Department of Water Economy I.U.N.G. at Bygdoszcz in the years 1950–1952. *Subject Headings:* **1. Evaporation from soil 2. Soil moisture 3. Bygdoszcz, Poland**—*A.M.P.*

5.10–170 551.57

Schmuck, Adam, **Stopien uwilgothienia w Polsce w latach 1948–1951.** [Moisture efficiency in Poland in 1948–1951.] *Przegląd Meteorologiczny i Hydrologiczny*, Warsaw, 5(3/4):24–36, **1952.** 3 figs., 5 tables, 7 refs. English summary p. 34. **DWB**—Results of a study of the distribution and alteration of the degree of moisture in Poland is presented. A short method of calculating the annual evaporation E by using the simple formula $E=21\ d$ was applied (d is the annual sum of mean monthly value sof saturation deficit; E and d both in mm). The ratio P/E (where P is precipitation) was computed for 42 stations in Poland. Attached maps show that the Odra River basin is more arid than the Vistula basin and that the "degree of moisture" has decreased since 1948. *Subject Headings:* **1. Evaporation calculations 2. Precipitation-evaporation ratio 3. Poland.**—*A.M.P.*

5.10–171 551.573:551.311.

Seliakov, N. IA., **Isparenie l'da v period ego kristallizatsii.** [Evaporation of ice during its crystallization.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofizicheskaia*, No. 5:460–462, **1953.** 3 refs. **DLC**—Experimental determination of the evaporation from ice during and after its formation was made in a chamber without heat and with good ventilation, so that temperature and humidity conditions were similar to those in the open air. The influence of the crystallization heat on the increase of evaporation during ice formation was detected. This influence contributes to the high evaporation rate often observed during night frosts in spring and autumn. *Subject Headings:* **1. Evaporation from ice 2. Ice formation.**—*N.T.Z.*

5.10–172 551.57

Stenz, Edward, **O parowaniu z molnej powierzchni sbiornikow wodnych.** [Evaporation from the surface of water catchment reservoirs.] *Gospodarka Wodna*, Warsaw, 13(6):211–213, June **1953.** 8 refs. **DLC**—The deplorable state of study of evaporation from open surfaces of water reservoirs in Poland is described and discussed. After having reviewed and criticized the various methods of direct measurement (Wild, Piché, Bindemann evaporimeters), of theoretical determination by computation (DALTON, SEFAN-SZYMKIEWICZ, JEFFREYS methods) or empirical techniques (STELLING, ROHWER, TRABERT, THORNTHWAITE and others) in which evaporation is presented as a function of one or other factors, whereby consideration of other values is not excluded, the author sums up the actual state of the problem and presents a series of suggestions on how to improve it. *Subject Headings:* **1. Evaporation from water surface 2. Evaporation measurement 3. Poland.**—*A.M.P.*

5.10–173 551.57

Uhlig, Siegfried (*Bad Kissingen*), **Berechnung der Verdunstung aus klimatologischen Daten.** [Calculation of evaporation from climatological data.] *Germany. Deutsches Wetterdienst, Bad Kissingen, Mitteilungen*, No. 6, Jan. **1954.** 24 p. 13 figs. **DWB**—Measurements of potential evaporation, according to WILD, PICHÉ and POPOV are compared with equations proposed by different authors. Thornthwaite's formula gave too high and Albrecht's too low values. For the computation of the actual evapotranspiration a method modified after ALBRECHT was adopted, which considers the saturation deficit and soil moisture. *Subject Headings:* **1. Potential evapotranspiration 2. Evapotranspiration.**—*A.A.*

CONDENSATION

See also: **Dew measurement** (Roginski), 5.10–24; **Investigat. of nuclei counter . . .** (Hentschel), 5.10–96.

5.10–174 551.574.1

†Collins, F. C. and Frisch, H. L., **Theoretical investigation of the growth of aerosol particles by diffusion.** Brooklyn. Polytechnic Institute. Dept. of Chemistry, Contract AF 19(122)-412, Report No. 2, May 1/July 31, **1951.** 21 p. 93 eqs. Also: Collins, F. C., . . . Final Report, [**1953**]. 35 p. 2 tables, 23 refs., 77 eqs. (For Report No. 3, Aug. 1/Oct. 31, 1951, *see item* 5.8–191, Aug. 1954, *MAB.*) **DWB**—1) In the preceding (Quarterly) Report an approximate solution is found for the moving sink boundary diffusion problem in one dimension. In this report, the method is extended to three dimensions and is compared with other methods found in the literature for the limiting case of aerosol particle growth. A general solution is presented in this report for the diffusion problem involving a general source function whereby additional molecules progressively become available for the diffusion process. 2) Fick's diffusion law is applied to the growth of aerosols under appropriate boundary conditions with due regard to the changing vapor pressure of the droplet and the effects of gravity and turbulence. *Subject Headings:* **1. Cloud physics 2. Drop diffusion 3. Condensation nuclei. I. Brooklyn. Polytechnic Institute. Dept. of Chemistry II. Contract AF 19(122)-412.**—*Authors' abstract.*

5.10–175 551.574.1

Frisch, H. L. and Collins, F. C., **Theoretical investigation of the growth of aerosol particles by diffusion.** Brooklyn. Polytechnic Institute. Dept. of Chemistry, Contract AF 19(122)-412, Scientific Report No. 2, [**1953?**] 14 p. 11 refs., 40 eqs. Mimeo. Also: . . . Scientific Report No. 3, [**1953?**] 9 p. table, 20 eqs., refs. **DWB**—1) The growth rate and radius of an aerosol particle in a turbulent supersaturated fluid is calculated on the basis of a simple "stagnant film" model, in the presence of time-dependent, homogeneously distributed sources in the diffusion field. The limiting growth law leads to a three-halves power dependence of the radius upon the time. The collapse of the supersaturation due to competition for molecules of the diffusing species among an initially monodisperse, homogeneous and random distribution of aerosol particles leads to an asymptotic in time final limiting critical radius. The critical radius attained is equal to the corresponding critical radius of an aerosol particle growing in fluid at rest in an infinite volume. The distribution of initially monodisperse aerosol particles remains monodisperse throughout the growth process. The application of the theory to the growth of water droplets in a turbulent cloud is indicated. 2) The effect of the velocity of a freely falling aerosol droplet upon its diffusion-controlled growth rate is evaluated. It is found that the velocity of the droplet in the diffusion field does not significantly accelerate its growth unless the radius of the particle exceeds 10^{-3} cm. Thus it appears that the effect of the gravitation fall of aerosol droplets during their growth from the supersaturated vapor may be safely neglected. *Subject Headings:* **1. Cloud physics 2. Drop diffusion 3. Condensation nuclei. I. Brooklyn. Polytechnic Institute. Dept. of Chemistry II. Contract AF 19(122)-412.**—*Authors' abstract.*

5.10–176 551.574.1(26)

Moore, D. J., **Measurements of condensation nuclei over the ocean.** *Marine Observer*, 24(163):18–21, Jan. **1954.** 3 tables, 6 refs. **MH-BH**—General account of nature and origin of nuclei. Observations on O.W.S. *Weather Observer* are described and summarized in relation to convective activity and state of sea. *Subject Headings:* **1. Condensation nuclei 2. North Atlantic.**—*C.E.P.B.*

5.10–177 551.574.1:551.578.41

*Ôkita, Tochi-ichi (*Geoph. Inst., Tôhoku Univ.*), **Electron-microscope study of ice-crystal nuclei in the natural atmosphere.** *Tôhoku University, Science Reports, 5th Ser., Geophysics*, 4(2):78–82, Oct. **1952.** 2 figs., 12 photos., 2 tables, 8 refs. Also in: *Meteorological Society of Japan, Journal*, 30(12):379–385, Dec. **1950.** **MH-BH**—As a member of a research group of the Tohoku Electric Power Company the author participated in experiments on artificial

production of snow on Mt. Zao in 1952. In this paper he reports on his technique for capturin ice crystals and examining them with an electron microscope. He describes observed prop erties of the condensation nuclei and presents data on their size distribution. Most of the ic crystal nuclei, the author finds, are soil particles. Photographs of nuclei under the electro microscope are presented. The article in *Met. Soc. of Japan Journ.* is in Japanese with Englis summary. *Subject Headings:* **1. Ice crystal nuclei 2. Electronic measurement 3. Laborator experiments.**—*G.T.*

FOG

5.10–178 551.575.

Hori, Jun-ichi, **Phenomenological approach to an aspect of the condensation mechanis of the atmospheric fog.** (In: Sapporo, Japan. Hokkaido University. Institute of Lo Temperature Science, **Studies on fogs in relation to fog-preventing forest. 1953.** p. 383–39 4 figs., ref., 29 eqs.) **MH-BH**—From the fundamental differential equations expressing wate content and heat content in an atmosphere considered as two dimensional space, simp diffusion equations describing the distribution of fog water content and atmospheric ten perature are obtained. The three principal effects—temperature, falling drop and diffusio effects—can then be discussed independently. The mutual coupling of these effects examined by considering "the non-linear term and using the successive approximation method Calculations carried out to the first order approximation lead to the conclusion that while th mutual coupling effect does not influence the distribution of fog water content it may alter th temperature distribution. The physical mechanism of vanishing and formation of fog particl is discussed and is represented mathematically. *Subject Headings:* **1. Fog mechanics 2. Co densation nuclei.**—*I.L.D.*

5.10–179 551.575:551.588

*Matsui, Zenki, **The stand-composition and growth of forests in foggy districts.** *Toky Forest Experiment Station, Bulletin*, No. 64:228–269, Oct. **1953.** 13 figs., 46 tables. Japanese; English summary p. 269. **DWB**—This is a major contribution supported by wealth of statistical data obtained from field measurements. It was concluded that secon growth broad leaf forest belts in the Ohta-Mura district (45 years old) were suitable inte ceptors of fog. The surface in this forest is 7.2 times as great as that of the ground are hence the air currents are sufficiently altered to stop the advance of fog. Alder forests a suggested for low lying coastal valleys. Yield of other types of forest (fir, larch, etc.) a tabulated with respect to maintenance of the forest for fog prevention as well as planned cutti and other uses of the land (agriculture, grazing, etc.). *Subject Headings:* **1. Fog preventi forests 2. Fog interception 3. Shelter belts 4. Ohta-Mura Region, Japan.**—*M.R.*

5.10–180 551.575.1:551.588

Morita, Uasutaro, **Fog preventing forest and weather. (Dissipation process of advecti fog.)** *Tokyo. Forest Experiment Station, Bulletin*, No. 64:1–4, Oct. **1953.** fig. In Japanes English summary p. 4. **DWB**—The dynamic and thermodynamic factors affecting the d sipation of advection fog are outlined and explained. The relation of forests to the absorpti of fog of various types, and the planning of fog preventing forests with respect to local weath situations in the Kusiro-Nemuro district of Japan are discussed. *Subject Headings:* **1. F prevention forests 2. Advection fog dissipation 3. Kusiro-Nemuro Region, Japan.**—*M.R.*

5.10–181 551.5

Morita, Uasutaro; Fujiwara, Rokuro and others, **On the sea fog invasion over Nemu and Kusiro district. (2).** *Tokyo. Forest Experiment Station, Bulletin*, No. 64:5–12, Oct. 19 9 figs., table, 3 refs., 2 eqs. In Japanese; English summary p. 12. **DWB**—Succeeding t research in the previous year (1951), the distribution of sea fog density was studied ov Kusiro-Akkeshi area during the period from July 25 to August 25, 1952. Twenty statio were established over this area, each station being installed with dry and wet bulb thermomet Robinson's anemometer, and fog-liquid-meter. The reduction-ratio of fog-liquid dens was calculated with the following empirical formula: $R = e^{-ax'}$ where R is the ratio of fog-liqu

density at any point to that at seashore; a the coefficient of diminution; x' the "effective distance," which is defined as follows: $x'=x+bn$ where x is the distance in km from seashore to that point along stream line; n the number of topographic contours which cross the stream line; b the coefficient of topographical complexity. Through observations, these coefficients were determined as follows: $a=0.1231$ $b=0.0174$. Thus the equi-ratio lines could be drawn on the 1/200,000 topographic map. The distribution of temperature and humidity were also studied. The results indicate that the gradient of these elements is steepest at 5–10 km in effective distance, but almost flat beyond 20 km. Concludes that "fog-defending-forest" should be set up at 5–10 km inland. *Subject Headings:* **1. Sea fog 2. Fog density 3. Fog prevention forests 4. Kusiro-Akkeshi Region, Japan.**—*Authors' abstract.*

5.10–182 551.575.1:551.588.6

Ôkita, T. (*Geophys. Inst., Asahigawa Branch, Hokkaido Gakugei Univ.*), **On the mechanism of dissipation of fog by model wood.** *Meteorological Society of Japan, Journal*, 2nd Ser., 31(7):237–247, July **1953.** 8 figs., 4 tables, 2 refs., 5 eqs. **MH-BH**—The size distribution of fog droplets in and around a model wood was investigated at Ochiichi, Hokkaido, for the purpose of determining the mechanism of the dissipation of fog by forests. The results indicate that the effect of capture by trees is predominant in respect to droplets with diameters above 10μ. During daytime the evaporation of droplets becomes intense in and behind the wood; it predominantly affects droplets with diameters of less than 10μ. An investigation of the vertical distribution of fog droplets in the daytime revealed that the proportion of small droplets is smaller near the ground and that the amount of fog water increases linearly with height. *Subject Headings:* **1. Fog dissipation 2. Drop size distribution 3. Fog prevention forests.**—*From author's abstract.*

5.10–183 551.575.1:551.588.6

Ôura, Hirobumi, **On the capture of fog particles by a forest. (1) and (2).** (In: Sapporo, Japan. Hokkaido University. Institute of Low Temperature Science, **Studies on fogs in relation to fog-preventing forest. 1953.** p. 239–259. 15 figs., 2 tables, 10 refs.) **MH-BH**—The amounts of fog entering and leaving a forest in a horizontal direction were measured by the use of vertical rectangular wire screens placed in front and behind the forest, respectively, while the amount of fog carried into the forest in downward directions was determined by means of a horizontal screen filled with mosquito netting and set above the tree crowns. The most effective forest in respect to capturing fog particles was that containing a sparse growth of needle leaved trees with no lower branches; next in effectiveness was dense forest bearing needle leaved trees with lower branches; the least effective forest was that containing both broad leaved and needle leaved trees and whose density was intermediate between that of the other two. Finally, the front surface of the forest was about three times more effective than the top surface. (*See also item* 4.7–147, July 1953, *MAB.*) *Subject Headings:* **1. Advection sea fog 2. Fog capture 3. Fog prevention forests.**—*Based on author's abstract.*

CLOUDS

5.10–184 551.576.1:551.507.352

Altocumulus castellatus from above. *Meteorological Magazine*, London, 83(985):219, July **1954.** fig., photo. **MH-BH**—Photograph from 18,400 ft west of Gibraltar, with tephigram. *Subject Headings:* **1. Altocumulus clouds 2. Airplane weather reconnaissance.**—*C.E.P.B.*

5.10–185 551.576.1:551.501.7:551.507.352

Investigations of cumuliform cloud. *Meteorological Magazine*, London, 83(985):208–215, July **1954.** 2 refs. **MH-BH**—R. J. Murgatroyd opened the Meteorological Office discussion with a review of the work of the Meteorological Research Flight in the investigation of cumuliform clouds. He described clear-air investigations around and below the clouds, and conditions within the clouds—up-currents roughly assessed in ft/sec as 14 (temperature difference °F between environment and saturated adiabatic). He referred to water content, cloud

particles, and the mechanism of shower production (often by coalescence). The discussion dealt mainly with coding of cloud reports by aircraft. *Subject Headings:* **1. Cumulus cloud 2. Airplane weather reconnaissance. I. Murgatroyd, R. J.**—*C.E.P.B.*

5.10–186 551.576.1:551.507.352

Stratocumulus cloud off Cape St. Vincent. *Meteorological Magazine*, London, 83(985) 219–220, July **1954.** fig., 2 photos. **MH-BH**—Two photos of stratocumulus in rolls in warm air ahead of a cold front. A cross section on a line 280° from Gibraltar is shown. *Subject Headings:* **1. Stratocumulus 2. Airplane weather reconnaissance.**—*C.E.P.B.*

PRECIPITATION

See also: **Rainfall radar studies,** 1951 (Stout, others), **5.10–29.**

5.10–187 551.577(54):551.509.33

Ramabhadran, V. K. (*Meteorological Office, Poona*), **A statistical study of the persistency of rain days during the monsoon season at Poona.** *Indian Journal of Meteorology and Geophysics*, 5(1):48–55, Jan. **1954.** 3 figs., 3 tables, 7 refs. **MH-BH**—A 60-year record of June–Sept. precipitation data for Poona has been used to determine the frequency of rainspells of various lengths. It has been found that the frequencies conform closely to a logarithmic series $\Sigma(ax^r/r)$. A method of predicting rain-days based on past rain, making use of the observed frequencies has been illustrated. Also, the use of the constant x of the logarithmic series in persistency forecast is discussed. Finally, the skill score of a persistency forecast of a rain-day following a rain period of 1, 2, . . . days duration has also been determined. Persistency itself may perhaps be construed as a meteorological factor and it may be possible to improve the accuracy of rain forecasts by applying the persistency theory in addition to the existing synoptic techniques. *Subject Headings:* **1. Monsoon rainfall persistence 2. Rainfall duration frequencies 3. Statistical studies 4. Poona, India.**—*Author's abstract.*

5.10–188 551.577.2:551.584.3(794)

Burns, Joseph I. (*Sacramento, Calif.*), **Small-scale topographic effects on precipitation distribution in San Dimas Experimental Forest.** *American Geophysical Union, Transactions* 34(5):761–768, Oct. **1953.** 6 figs., table, 14 refs. Discussion by Walter T. Wilson, p. 768, 1 ref. **MH-BH**—A nomogram shows the dependence of annual precipitation on elevation, slope, rise, aspect and zone of influence. The resulting precipitation maps provide much greater detail than the previously existing isohyetal maps. The correlation with 96 gages used in the development of the nomogram and with 45 check gages is 0.84, comparing with approx. 0.70, if the elevation-precipitation relation only is used. *Subject Headings:* **1. Precipitation distribution 2. Topographic influences 3. San Dimas Experimental Forest, California I. Wilson, Walter T.**—*A.A.*

5.10–189 551.577.2:551.509.318(43)

*Maede, Hans, **Die Regenwetterlagen an der südlichen Ostsee.** [Rain weather types of the southern Baltic.] *Germany. Deutsche Demokratische Republik. Meteorologischer und Hydrologischer Dienst, Abhandlungen*, 4(30), **1954.** 121 p. 8 figs., 18 charts, 33+25 tables, 66 refs. **DWB**—The investigation is based on 1700 daily charts on occasions of precipitation (at least 0.1, 1, 5 and 10 mm) at Greifswald. These were classified into 10 weather types and frequencies in each month discussed. In Pt. 2 amounts at 10 stations are tabulated in relation to more general types: west weather, summer monsoon, fronts, shower weather, Vb depressions, thunderstorms and snow. The effects of the Baltic, North Sea and configuration on the distribution in various types are discussed, and the normal seasonal and annual rainfall charts interpreted in the light of the results. The charts show rainfall distribution over east Germany accompanying certain types (west, northwest, warm fronts, shower days, cold front occlusion and snow) in selected months. *Subject Headings:* **1. Precipitation distribution 2. Weather types 3. Germany.**—*C.E.P.B.*

5.10–190 551.577.36(439.1)

*Szilágyi, Tibor, **Mosonmagyaróvár nyolcvan éves csapadékmegfigyeléseiből számított gyakorisági értékek.** [Frequency values computed from 80-year precipitation records for Mosonmagyaróvár.] *Időjárás*, Budapest, 57(4):207–214, July/Aug. **1953.** 2 figs., tables. Russian and German summaries p. 207. **MH-BH, DLC**—Two tables and 2 figs. are presented with explanatory comments. Table 1: Total precipitation for each month of the period 1871–1950; mean monthly precipitation for the same period; comparison of monthly mean precipitation 1871–1950 with 1901–1940. Table 2: Monthly total precipitation values 1871–1950 arranged in order of magnitude. Fig. 1: Extreme values of monthly total precipitation, its average, median value and two quartiles (1871–1950). Fig. 2: Curves of frequency values of total precipitation amounts for each month of the year. *Subject Headings:* **1. Precipitation data 2. Precipitation frequencies 3. Mosonmagyaróvár, Hungary.**—*G.T.*

5.10–191 551.577.38(439.1)

Mátyus, József Sz., **Magyarország légköri aszályairól.** [Atmospheric drought in Hungary.] *Időjárás*, Budapest, 57(5):257–265, Sept.–Oct. **1953.** 7 refs. **DLC, MH-BH**—The occurrence of "atmospheric drought" in Hungary is investigated on the basis of concurrent temperature, relative humidity and wind speed values. Several degrees of drought are established and their daily and annual variations are examined in hourly data for Budapest. The general geographic distribution of atmospheric drought in Hungary is outlined. *Subject Headings:* **1. Drought 2. Hungary.**—*Author's abstract (trans.).*

SNOW

See also: **Avalanche handbook** (U. S. Forest Serv.), 5.10–11; **Effect of atmos. pressure oscillations on ground water level** (Meissner), 5.10–141; **Ice-crystal nuclei in atmos.** (Okita), 5.10–177.

5.10–192 551.578.41

Itoo, K.; Yano, T. and Hama, K. (*Met. Res. Inst., Tokyo*), **Size distribution, crystal form and falling velocity of snow-flake.** *Meteorological Society of Japan, Journal*, 2nd Ser., 31(6):219–231, June **1953.** 13 figs., table. In Japanese; English summary p. 219. **MH-BH**—Methods of observing size distribution (filter paper), form (microphotography) and falling velocity (photographic technique) of snowflakes (mainly of the graupel type) are explained and sample data obtained by such methods presented. *Subject Headings:* **1. Snow crystals 2. Snowfall.**—*G.T.*

5.10–193 551.578.41

*Kuroiwa, Daisuke, **The dielectric behavior of snow cover.** *Low Temperature Science*, Sapporo, Japan, 8:1–57, **1951.** 30 figs., 17 refs. In Japanese; English summary p. 56–57. **DWB**—Results of extensive experiments on the dielectric properties of blocks of snow cut from open fields. To properly describe the physical properties of snow, three quantities must be known: (1) temperature, (2) specific gravity, (3) dielectric constant "U." Snow of same temperature and density but different structure show different values of "U." "U" is smaller for granular structure and larger for coherent structure and very large when snow is wet, so it is a useful parameter for determination of thaw water content. Snow and ice differ radically in electric properties. *Subject Headings:* **1. Snow physics 2. Dielectric properties of snow 3. Japan.**—*From author's abstract.*

5.10–194 551.578.46:551.556

Pugh, H. Ll. D. and Price, W. I. J., **Snow drifting and the use of snow fences.** *Polar Record*, 7(47):4–22, Jan. **1954.** 20 figs., 30 refs. **DWB**—A review based on English, German, Russian and Scandinavian papers. Snow drifting by suspension and saltation is described and the eddy region in the wind stream formed by a solid wall and open fence is shown. The length of the drift can be computed from the height and density ratio of the fence. The most efficient density ratio is 40–50%. Types of fences and their arrangement in relation to the prevailing wind directions are shown. *Subject Headings:* **1. Snow drifts 2. Snow fences.**—*A.A.*

HYDROMETEOROLOGY

See also: **Role of shelter belts on water regulation** (Sukharev), 5.10–161; **Ground evaporation of wheat on loams** (Ostromeçki), 5.10–169.

5.10–195 551.579:016(68,673

†Frommurze, H. F. (*Asst. Dir. Geological Survey, South Africa*), **Hydrological research i arid and semi-arid areas in the Union of South Africa and Angola.** (In: UNESCO, **Review of Research on Arid Zone Hydrology, 1953.** p. 58–77. 4 maps, table, 202 refs.) **DWB**— literature review of papers dealing with rainfall, runoff, evaporation, transpiration, infiltratio water capacity and permeability of rocks, artesian water and prospecting for water in Sout Africa. Schematic rainfall maps for the Union of South Africa and Angola are added. *Subje Headings:* **1. Hydrologic bibliographies 2. Rainfall charts 3. Hydrologic cycle 4. Sout Africa 5. Angola.**—*A.A.*

5.10–196 551.5

*Wrather, W. E. (*Dir. U. S. Geological Survey*), **Summary of the water situation wit respect to annual runoff in the United States.** (In: U. S. Congress. House. Committee Interior and Insular Affairs, **Physical and Economic Foundation of Natural Resources,** Vol. 36–41, **1952.** 2 figs., 2 tables.) **DWB**—Gives the frequency distribution of annual runo over the United States and the estimated flow to the oceans from different regions, shows ho the precipitation is used for runoff and evapotranspiration in 12 main basins and presents schematic map of annual runoff. *Subject Headings:* **1. Hydrologic cycle 2. Runoff 3. Unite States.**—*A.A.*

5.10–197 551.5

*Williams, G. R. (*Knappen Tippetts Abbett Engineering Co.*), **Hydrology.** (In: **Engineerin hydraulics,** ed. by Hunter Rouse. N. Y. John Wiley, **1950.** p. 229–320. 38 figs., 8 table 59 refs.) **DWB**—An outline of hydrology, discussing basic meteorological principles (gener circulation, air masses, theory of precipitation); climatology (maps of annual temperature a precipitation for U. S.); runoff and its dependence on temperature and precipitation (runo maps for U. S. and the Connecticut River basin); ground water, storm rainfall (intensit depth duration and depth-area curves, importance of annual rainfall maps); storm run (unit-hydrograph, drainage-basin characteristics); relation between storm rainfall and run and the rational theory of surface runoff. *Subject Headings:* **1. Hydrology 2. Climatic cha 3. Runoff maps 4. Unit hydrographs 5. Connecticut River 6. United States.**—*A.A.*

5.10–198 551.57

Hazen, Richard, **Analyses and use of surface water data.** *Illinois. State Water Surv Division, Bulletin,* No. 41, **1952.** p. 87–98. **DWB**—Deals mainly with the hydrologic problems of average and minimum flows, stressing the mean runoff as the most importa characteristic of any stream. Yet the evaporation from a large reservoir may, under favoral conditions, become even greater than the stream flow. The stream flow gaging (particula on small, undeveloped rivers) is extremely significant for upstream data. Finally, it is point out that the understanding of stream flow behavior is dependent on greater knowledge meteorology in relation to runoff. Useful tables and curves are presented. *Subject Headin* **1. Hydrometeorology 2. Runoff 3. Surface water data analysis.**—*W.N.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATE OF PARTICULAR PLACES

See also: **Weather types and weather elements over Antarctic Ocean . . .** (Vowinckel, Oosthuizen), 5.10–37; **Climatic change and climatological statistics** (Ogawara, others), 5.10–205.

5.10–199 551.582(9

*[Bantegui, Celia Gallego and Koh, Severino L.] **Climate of cities in the Philippin 1. Manila.** *Philippines. Weather Bureau, The Elements,* 3(1):14, Jan. **1952; 2. Cebu,** 3(2):

Feb. 1952; 3. **Zamboanga City,** 3(3):14, March 1952; 4. **Baguio City,** 3(4):10, April 1952; 5. **Dagupan City,** 3(5):12, May 1952; 6. **Quezon City,** 3(6):12, June 1952; 7. **Tagaytay City,** 3(7):18, July 1952; 8. **Naga City,** 3(8):12, Aug. 1952; 9. **Legaspi City,** 3(9):12, Sept. 1952; 10. **Calbayog City,** 3(10):12, Oct. 1952; 11. **Roxas City,** 3(11):18, Nov./Dec. 1952. tables. **DWB**—Monthly averages of temperature, rainfall amount, number of rainy days and wind direction and velocity are presented for periods of varying length. In the case of cities for which continuous records of sufficient length are not available, only approximate averages and extremes are indicated, in addition to general descriptions of climatic characteristics. *Subject Headings:* **1. Climate of the Philippine Islands 2. Philippine Islands.**—*G.T.*

5.10–200 551.582:551.481.1(439.1)

Zách, Alfréd, **Érdekes adatok a Balaton különleges időjárási viszonyaihoz.** [Interesting data on the particular weather conditions of Lake Balaton.] *Természet és Technika*, Budapest, 111(9):571–573, Sept. **1952.** figs. **DLC**—Among the climatic features of Lake Balaton the author discusses: (1) *Radiation.* Reflection from the water surface increases radiation, especially during wave activity. Comparative data on monthly total radiation at Budapest and at Balatonfüred are presented. (2) *Wind.* Strongest wind on record is 94 m.p.h. Land-and-sea breezes produce local climatic effect. Obstruction by mountain range in the north causes limited föhn effect, sudden gusts, turbulence and considerable wave activity. Fata Morgana is a side feature of the föhn effect. 75% of the strong winds come from NW. (3) *Evaporation.* It is more intense over the shallow, marshy southern part of the lake than over deep waters or the land. This difference causes instability, ascending air and cloud formation. *Subject Headings:* **1. Local climates 2. Lakes and rivers 3. Orographic effects 4. Lake Balaton, Hungary.**—*G.T.*

5.10–201 551.582.1/2(71)

*Canada. Meteorological Div., **The climate of Canada.** Ottawa, Edmond Cloutier, **1949.** 61 p. 3 charts, table (p. 26–61). Reprinted from *Canada Year Book*, Pt. I, p. 41–62, **1948–1949;** Pt. II, p. 34–70, **1950. DLC, DWB**—Pt. I is a discussion of temperature and precipitation in each of the 8 climatic regions (shown on map). Pt. II consists of tables of monthly averages of usual meteorological elements for 35 stations (period of record for temperature is 50 years, period of record for other elements not stated) with their geographic coordinates. Charts show mean Jan. and July temperatures. *Subject Headings:* **1. Climate of Canada 2. Climatic data 3. Canada.**—*M.L.R.*

5.10–202 551.582.2(436)

*Hader, Fritz (*St. Pölten*), **Der Wienerwald als Wetterscheide.** [The Vienna Woods as a weather divide.] *Wetter und Leben*, 5(5–7):152–161, Nov. **1953.** 7 tables, 7 refs. **MH-BH**—While on climatic maps of lower Austria the northeastern extension of the Alps, the Vienna Woods, does not constitute a marked climatic divide, certain distributions of diseases caused by weather and personal experience of the author indicate the reverse. The characteristics of the meteorological variables of Vienna and St. Pölten on the one hand and those of Eichgraben for the period 1947–1951 are compared. Tables give data on the seasonal distribution of the weather situations effective in the northeast Alps, the average difference of mean daily temperature and of 1400 hours temperature between Vienna and Eichgraben and between St. Pölten and Eichgraben for the various weather types during the different seasons, average difference of daily mean of relative humidity and cloudiness and daily means of precipitation associated with the different weather situations during the different seasons. It is shown that Vienna is warmer than St. Pölten and has a lower relative humidity, precipitation and cloudiness. *Subject Headings:* **1. Climatic data 2. Weather types 3. Climate of Vienna 4. Climate of St. Pölten 5. Austria.**—*I.L.D.*

5.10–203 551.582.2(436)

*Lauscher, F. and Roller, M. (*Vienna*), **Die Witterung in Österreich 1943–1952 und ihre wirtschaftliche Auswirkung.** [The weather in Austria during 1943–1952 and its economic effects.] *Wetter und Leben*, Vienna, 5(5/7):103–108, Aug. **1953.** table, 12 refs. **MH-BH**—An examination of the annual deviations of the temperature, precipitation, cloudiness and

sunshine duration for the years 1943 to 1952 from the 1881–1930 average and of the runo of the Danube at Vienna shows that these ten years were marked by increased temperatur increased sunshine duration and cloudiness; precipitation on the average was the same a the normal values; on the whole, runoff shows a decrease as compared with the 1893–194 average. The authors describe the effects of droughts during the 1943–1952 period upo forests, drinking water supply, fisheries and crop yields, and discuss the retreat of the glacier avalanche weather of June 1951 and intense hailstorms that occurred in various parts o Austria during this period. *Subject Headings:* **1. Climatic data 2. Climate of Austri 3. Water supply 4. Hailstorms 5. Austria.**—*I.L.D.*

5.10–204 551.582.2(497.1

*Yugoslavia. Hidrometeorološka Služba, **Temperatura, vetar i oblačnost u Jugoslavij Rezultati osmatranja za period 1925–1940.** [Temperature, wind and cloudiness in Yugoslavia Results of observations, 1925–1940.] Its *Prilozi poznavanju klime Jugoslavije*, No. 1, **1952** 104 p. mostly tables, 4 charts (1 fold.). **DWB**—Extensive tables of monthly and annua average and extreme temperature, wind and cloudiness for the 16 year period 1925–1940 a presented for about 166 stations in Yugoslavia. Dates of frost or last occurrence of mea temperatures of <0° or 5°, 10° and 20°C; of max. ≥25°C, <0°C or >30°C; of mi <0°C, <−10°C or >20°C, and of number of days with temperature in various categorie or of winds > force 6 or 8, and of mean cloudiness <2.5 or >7.5, and annual, Jan. and Ju isothermal and annual wind rose charts are included. *Subject Headings:* **1. Climate of Yug slavia 2. Climatic data 3. Yugoslavia.**—*M.R.*

CLIMATIC CHANGES

5.10–205 551.583:551.582(5

*Ogawara, M.; Ozawa, T.; Suzuki, T. and Tomatsu, K., **Climatic change in Japan an climatological statistics.** *Journal of Meteorological Research*, Tokyo, 4(8):461–525, No **1952.** fig., tables. In Japanese; English summary p. (31)–(32). **MH-BH**—Basic concep and requirements of climatological statistics are defined. Monthly pressure and temperatu variations, frequency of typhoons, precipitation amounts and dates of last frost and la snow in Japan are analyzed for the period 1901–1950. Stationary periods of these meteor logical elements are determined for several representative stations. Practical applications the statistical results (such as determining rejection and tolerance limits) are discusse *Subject Headings:* **1. Climatic variations 2. Statistical analysis 3. Statistics in climatolo 4. Japan.**—*G.T.*

5.10–206 551.583(

Schindler, Gerhard, **Zum Stande der neuzeitlichen Klimaschwankung.** [The status the present climatic variations.] *Wetter und Leben*, Vienna, 5(5/7):127, Aug. **1953. MH-B** —Although over large parts of Europe the climate has recently become more continent the temperature is still rising; colder winters are being overcompensated by warmer sprin and summers. Various indications of this warming up are tested, namely the rise of Atlan Ocean temperatures of 1/2°C for 1941–50 as compared with 1901–30; the ice index of Icela has declined from 53 for 1855–96 to 18 for 1897–1918 and to 2 for 1919–1939, etc. *Subj Headings:* **1. Climatic variations 2. Europe.**—*I.L.D.*

5.10–207 551.583.14(497

*Goldberg, Josip, **Prilozi istraživanju klimatskih fluktuacija u Jugoslaviji.** [Contributi to the investigation of climatic fluctuations in Yugoslavia.] *Zagreb. Sveučilište. Geofizič Institut, Radovi*, Ser. 3, No. 3, **1953.** 27 p. 15 tables, 4 figs., 15 refs. In Croatian; Ger summary p. 21–27. **DWB, DLC**—On the basis of climatic data for seven overlapping 30-ye periods (Zagreb-Grič Observatory, 1862–1950), the author investigates climatic trends appe ing in precipitation amount, cloudiness, temperature, index of continentality and of oceani etc. It appears that there have been two principal tendencies in the climate of Yugosla since the beginning of the 20th century, viz.: a) an increase in oceanity and b) an accentuati of subtropical elements. Both tendencies are due to pressure increase in the subtropical hig pressure region. *Subject Headings:* **1. Climatic trends 2. Zagreb, Yugoslavia.**—*G.T.*

MICROCLIMATOLOGY

See also: **Limnology of Vienna forest stream** (Inst. of Sci. and Arts, Vienna), 5.10–3; **Topographic effects on precip. distribution** (Burns), 5.10–188.

5.10–208 551.584.61

Giese, Henry and Bond, T. E., **Design of a plate-type heat exchanger.** *Agricultural Engineering*, 33(10):617–622, Oct. **1952.** 11 figs., 3 tables, 11 refs. **DLC**—Heat exchanger designed to improve animal-shelter ventilation during cold winters. Tests show that barn temperature could be maintained above 50°F at −8.2°F outside and above 38°F at −20°F outside. Theory discussed and nomograms for design and operation of heat exchangers dependent on outside weather conditions (temperature, humidity) presented. *Subject Headings:* **1. Barn climates 2. Air conditioning.**—*A.A.*

5.10–209 551.584.61

Kitamura, K., **Meteorological conditions in the "Shōsōin" Treasure House.** *Journal of Meteorological Research*, Tokyo, 4(9):705–710, Feb. **1953.** 6 tables. In Japanese; English summary p. (43)–(44). **MH-BH**—Data on indoor temperature and humidity are tabulated and compared with outdoor values (Dec. 1949–April 1950). *Subject Heading:* **1. Indoor climates.**—*G.T.*

BIOCLIMATOLOGY

5.10–210 551.586

Stružka, Vladimír, **Biometeorologické methodiky a jejich aplikace v biologickém výzkumu.** [Biometeorological techniques and their application in biological research.] *Meteorologické Zprávy*, 6(2):62–65, May **1953.**—In this lecture delivered at a meeting of biologists and meteorologists, the author describes advisable methods of meteorological measurement for biologically significant results. He discusses preparatory considerations (geographic location, surroundings, insolation conditions); choice of instruments for temperature, humidity, pressure, precipitation, sunshine, aerosol, evaporation and electricity measurement; recording of macro- and micrometeorological factors; spatial distribution of stations and frequency (or continuity) of observations. *Subject Heading:* **1. Biometeorology.**—*G.T.*

5.10–211 551.586:612.2

†Tákacsy, László, **Újabb vizsgálatok a hirtlen szívhalál meteoropoathológiai vonatkozásairól 1000 boncolás kapcsán.** [Investigation of the meteoropathological aspects of sudden heart failure based on 1000 autopsies.] *Időjárás*, Budapest, 57(5):272–287, Sept./Oct. **1953.** 10 figs., 4 tables, 40 refs. **MH-BH**—The effect of frontal passages on the time of death is investigated on the basis of 1000 autopsies. The pathological structural changes which caused the deaths are described. The investigation reveals accumulations of mortality grouped around frontal passages. According to a statistical significance test these accumulations are due to a biological effectiveness of fronts rather than to chance. *Subject Headings:* **1. Weather sensitivity 2. Pathology 3. Heart disease.**—*Author's abstract (trans.).*

5.10–212 551.586:796.52(235.243)

Pugh, L. G. C. E., **Scientific aspects of the expedition to Mount Everest, 1953.** *Geographical Journal*, 120(2):183–192, June **1954.** 13 refs. **DLC**—The paper includes an account of methods of acclimatization to heights above 18,000 ft, training in use of oxygen (closed and open circuits), effects of oxygen supply and effects of height on nutrition. Climatic considerations were studied in relation to clothing and equipment. Notes are given on temperatures, including night minima and black bulb, and wind speeds. *Subject Headings:* **1. Bioclimatology 2. Mountaineering 3. Mount Everest.**—*C.E.P.B.*

5.10–213 551.586:91.04(213)

Grober, Julius, **Triennium bioclimaticum tropicale.** [Three-year study period of tropical bioclimatology.] *Forschungen und Fortschritte*, Berlin, 28(6):176–178, June **1954.** 2 refs. **DLC**—Increasing world population calls for increased settlement of tropical and subtropical regions. First step must be a close investigation of effects of climate on plants, animals and

men. Author proposes a "tropical triennium" on lines of Polar Years (one year is not enough) preferably in connection with the proposed "Geophysical Year" 1957–1958. *Subject Headings:* **1. Bioclimatology 2. Tropical triennium.**—*C.E.P.B.*

ENVIRONMENTAL INFLUENCES

See also: **Correlation between coefficient of continentality . . .** (Xanthakis), 5.10–136; **List of subject headings** (U. S. Library of Congress. Techn. Info. Div.), 5.10–139; **Effect of windbreaks and interception of fog . . .** (Mishima, others), 5.10–159; **Fog prevention forests** (Matsui), 5.10–179; **Fog preventing forest and weather** (Morita), 5.10–180; **Mechanism of dissipat. of fog . . .** (Ôkita), 5.10–182; **Fog capture by forest** (Ōura), 5.10–183.

5.10–214 551.588:6

Marston, H. R., **Nutritional problems of the animal as determined by plant and soil** (In: Specialist Conference of Plant and Animal Nutrition in Relation to Soil and Climatic Factors, Australia, **1949,** *Proceedings*, Pub. 1951, p. 247–266. 6 tables.) **DWB**—Climatic variables influence soil and vegetation hence composition of fodder and the nutritional state of the animals by influencing energy requirements of the animal. The author considers the energy requirements of the ruminant and the effect of environmental temperature on the capacity of fodder to meet these requirements; protein metabolism in the ruminant and the biological value of proteins in the fodder; the utilization of phosphorus and calcium in ruminants, and cobalt and copper deficiency. *Subject Headings:* **1. Climatic influences 2. Animal ecology 3. Nutrition.**—*I.L.D.*

5.10–215 551.588.

*Zinkiewicz, Włodzimierz, **Zagadnienie oceanizmu i kontynentalizmu klimatu Polski** [Problem of the oceanity and continentality of climate of Poland.] *Lublin. Uniwersytet Marii Curie-Skłodowskiej, Roczniki, Sec. B,* 6(1):1–59, **1951.** 19 figs., 6 tables, 41 refs. In Polish; Russian and German summaries p. 45–59. **DWB**—Various criteria for continentality as advanced since 1884 (Voeĭkov and Köppen) are discussed. Emphasizes fact that % of calms is an important factor as it affects annual and diurnal temperature amplitude. A formula is presented for calculating a dynamic index of oceanity on the basis of frequency of continental or maritime air masses

$$W_0 = \frac{\Sigma (Pm + Tm)}{\Sigma [Ac + Pc + Tc) + c]} \cdot 100$$

and isotherms drawn for Poland to show variations over that country. Comparison is made with other places in Europe and between different years at Lublin. *Subject Headings:* **1. Continentality 2. Oceanity 3. Poland.**—*M.R.*

5.10–216 551.588.2:551.555.5

Gregor, Alois, **Příspěvek k charakteristice "místního" počasí na juhovýchodní Moravě** [Characteristics of local weather in southeast Moravia.] *Meteorologické Zprávy,* 6(2):53–55, May **1953.** 6 figs., 7 tables, 13 refs.—Typical features of southeast Moravian föhn situations are described. The region which is subject to föhn winds is shown in a map. Sample records and data (wind, temperature, humidity, cloudiness, insolation) indicating föhn effects are presented. Special phenomena are discussed in connection with several föhn winds observed in the area. *Subject Headings:* **1. Föhn winds 2. Moravia, Czechoslovakia.**—*G.T.*

MISCELLANEOUS APPLICATIONS

SOLAR INFLUENCES

5.10–217 551.590.21:551.52

Hanzlík, Stanislav, **Teplotní efekt periody slunečních skvrn ve Střední Evropě.** [Temperature effect of the sunspot period in Central Europe.] *Meteorologické Zprávy,* 6(2):31–3 May **1953.** figs., tables.—The tables and graphs presented contain the final results of a stud

n which long period temperature records for Prague, Vienna, Jena and other Central European stations were investigated (by means of Mecking's method) in connection with sunspot maxima and minima. It is found that Central European temperature records reflect the double period of sunspot activity (Hale effect) in addition to the single period (this latter had been identified for a long time). *Subject Headings:* **1. Sunspot effects on temperature 2. Central Europe.**—*G.T.*

5.10–218 551.590.21:523.74

Tetrode, P. (*Soesterberg, Netherlands*), **Seasonal effects in meteorology of solar origin.** *Schweizerische Naturforschende Gesellschaft, Aarau, Verhandlungen*, **1952**, p. 128–130, pub. 1953. **DWB**—Computes temperature deviations for different places in Europe and the United States arranged according to their positions within the sunspot cycles, finds systematic mean effects and compares these with BAUR's results. *Subject Headings:* **1. Sunspot effects 2. Temperature deviations 3. Europe 4. United States.**—*A.A.*

REFRACTION PHENOMENA

See also: **Stellar scintillation** (R. Met. Soc., R. Astronomical Soc.), 5.10–10; **UV sky radiation** (Sekihara), 5.10–134.

5.10–219 551.593.1

Abnormal refraction off Port Okha (West coast of India). *Marine Observer*, 23(162):203, Oct. **1953.** 7 figs. **DWB**—Seven sketches of deformation of rising sun on Nov. 2, 1952. *Subject Heading:* **1. Refraction phenomena.**—*C.E.P.B.*

5.10–220 551.593.1:621.396.8

Elnesr, Mustapha, **Mesure directe du gradient de l'indice de réfraction de l'air dans la basse atmosphère.** [Direct measurement of the gradient of the refractive index in the lower atmosphere.] *Académie des Sciences, Paris, Comptes Rendus*, 238(13):1440–1442, March 29, **1954.** fig., ref., 8 eqs. **DLC**—The apparatus described in this note (circuit diagram presented) furnishes direct readings of the vertical gradient of refractive index for very-high-frequency wave propagation. The instrument essentially consists of thermocouples arranged along a vertical plane. The vertical refractive-index gradient is obtained as a function of pressure, temperature and humidity gradients. *Subject Heading:* **1. Atmospheric refraction.**—*G.T.*

5.10–221 551.593.1

Roberts, J. G., **Rocky Mountain antics.** *Weather*, 8(1):32, Jan. **1953. MH-BH**—Brief account of refraction phenomena in N.W. Canada. *Subject Headings:* **1. Refraction phenomena 2. Northwest Canada.**—*C.E.P.B.*

ELECTRICAL PHENOMENA

See also: **Radar echo interpretation** (Vassy), 5.10–30; **Electron density in upper atmos.** (Mariani), 5.10–101.

5.10–222 551.594.11:551.510.535

Parkinson, W. D. and Chalmers, J. Alan, **Atmospheric space charge.** *Journal of Atmospheric and Terrestrial Physics*, 5(2):106–108, May **1954.** table, 2 refs. **DWB**—Referring to note by CHALMERS in *J. Atmosph. Terr. Phys.*, 3:345–346, **1953** (*see item* 5.2–297, Feb. 1954, *MAB*), PARKINSON points out that Tucson showed increase of mean current density 1931–39 and decrease 1939–47, while Watheroo had no such change. This is against argument that current compensates world-wide thunderstorm activity. CHALMERS replies. *Subject Headings:* **1. Ionosphere 2. Potential gradient.**—*C.E.P.B.*

5.10–223 551.594.12/3:551.510.535

Maeda, Ken-ichi, **On the electrical conductivity of the upper atmosphere.** *International Council of Scientific Unions. Mixed Commission on Ionosphere, 2nd Meeting, Brussels, Sept.*

1950, *Proceedings*, p. 215–227. table, figs., 12 refs., eqs. Summary in French p. 227. **DWB—** A survey of knowledge of electrical conductivity of ionosphere in respect to diurnal variatio of terrestrial magnetism. The methods of determining the density of electron/ion ratio an collision frequencies from ionospheric measurements and the vertical distribution and in tegrated value of the electrical conductivity and their changes from day to night are discusse theoretically and models presented based on the latest empirical data. The maximum electro density is taken as 10^5 at 110 km (E layer) and 10^6 at 260 km (F_2 layer) for daytime and 1/ (E layer) or 1/8 (F layer) as much at night. Overall conductivity at night is about $3.15 \times 10^{-}$ *emu* or 1/6 daytime value. *Subject Headings:* **1. Ionospheric conductivity 2. Electron densitie in ionosphere.**—*M.R.*

5.10–224 551.594.13:551.508.94:551.311.1

Pluvinage, P. and Stahl, P., **La conductibilité électrique de l'air sur l'inlandsis Groenl landais.** [Electrical conductivity of air over the inland ice of Greenland.] *Annales d Géophysique*, 9(1):34–43, Jan./March **1953.** 5 figs., 21 refs. **DWB**—Detailed report d measurements made during the summer 1951 on a cross profile through central Greenlan Apparatus and methods used are described and actual data are given together with temperatu and wind conditions. The total conductivity is relatively constant over the inland ice, whil the negative conductivity is abnormally weak. The ratio between positive and negativ conductivity was always greater than unity, increased toward the center of the ice cap an reached up to 10 under extreme conditions (low wind speed). *Subject Headings:* **1. Electric conductivity of air 2. Conductivity meters 3. Polar expeditions 4. Greenland ice ca 5. Greenland.**—*A.A.*

5.10–225 551.594.2:551.508.9

Holzer, Robert Edward (*Calif. Univ. at L.A.*), **Studies in atmospheric electricity.** Ca fornia. University. Institute of Geophysics, Contract AF 19(122)-254, Reports, No. 3 and 4, Oct. 15, **1950** to Dec. 15, **1950;** Dec. 15, **1950** to March 15, **1951;** June 15, **1951.** 10 p 8 p.; 5 p. 7+6+3 figs., 4+2 tables, 8+10+2 refs., 11 eqs. **DWB**—In Report No. 2 da for diurnal variations of relative columnar resistance at five widely distributed points of t earth are presented and compared in tables and graphs, and their correlation with the dai cycle of turbulence examined. A brief description of the construction of a potential gradie recorder of the field mill type and indications as to future aims of the project are given. Repo No. 3 describes and illustrates a recorder of field mill type and other types of equipment bei developed. The distribution of conduction currents in the vicinity of thunderstorms studied by means of a simple model. Report No. 3 describes measuring equipment to used in the field program. The first potential gradient meter has been made for measureme of the polarity of the field. A second portable battery operated potential gradient meter h been constructed. Other equipment to be used are referred to briefly. *Subject Heading* **1. Atmospheric electricity 2. Atmospheric electricity instruments 3. Thunderstorm ele tricity 4. Potential gradient meters. I. California Univ. at Los Angeles II. Contract A 19(122)-254.**—*G.T., M.R., Author's abstract.*

PART II. ANNOTATED BIBLIOGRAPHY ON INDUSTRIAL METEOROLOGY

By: *C. E. P. Brooks and G. T. Evans*

INTRODUCTORY NOTE

This bibliography aims at giving a representative selection of works dealing with the manifold ways in which meteorology and climatology can aid industry and commerce. It is divided into six sections:

A. General and miscellaneous, the latter including works which do not fall into any of the remaining sections;

B. Effect of climate and weather on materials. This group includes a number of important papers on the effect of atmospheric conditions, especially temperature, humidity and atmospheric pollution, on the deterioration of materials of all kinds;

C. Effect of weather on transport by road, rail, sea and air. This includes a selection of works on subjects such as damage to roads, frost on railways, protection against snow, protection of ships' cargoes against moisture, icing of aircraft, etc.;

D. Weather interference with electrical and radio communication. This is mainly concerned with the effect of lightning, but a few papers deal with other elements;

E. Solar radiation, wind and water as sources of power;

F. Construction, lighting, heating and air conditioning of buildings (other than dwelling houses).

The dagger (†) indicates a good bibliographic source. Several bibliographies published previously in *Meteorological Abstracts* furnish additional sources of material. For the effect of atmospheric pollution on building materials *see* A–17 and –43 (v. 1, No. 1, Jan. 1950); for hail damage to aircraft *see* D–226, –227, –232, –233, –240, –244 (v. 1, No. 4, April 1950); for icing of aircraft *see* I–1 to I–181 (v. 1, No. 9, Sept. 1950) and for the effect of glaze and rime on aircraft and electric services *see* 3J–6, –11, –20, –38, –40, –49, –61, –64, –65, –68, –71, –73, –83, –86, –101, –102, –119, –128, –141, –145, –159, –178, –181, –189, –190, –201, –203, –204, –206, –210, –223 (v. 3, No. 10, Oct. 1952).

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A. GENERAL AND MISCELLANEOUS

1928

5J–1 551.510.42:551.55

Rempp, G., **L'emplacement futur de l'industrie à Strasbourg considéré au point de vue régime du vent.** [The future location of industry in Strasbourg considered from the point of vi of the wind regime.] *Strasbourg. Université. Institut de Physique du Globe, Météorologie, Annal* Pt. 1:100–101, 1928. **DLC, DWB**—Compares winds at Strasbourg (NNE and SSW) and neig bouring Toussaint on a hill (mainly SW), and location of industry, discussed in relation to wil frequency and also turbulence, including difference between day and night. He finds that win from E to ESE are most frequent during afternoon when smoke is soon dissipated and rare at nig when smoke drifts. (*Same item as* 3G–91, July 1952, *MAB.*) *Subject Headings:* **1. Town planni 2. Strasbourg, France.**

1934

5J–2 551.58:551.43:6

Schmidt, Wilhelm, **Hochgebirgsklima und Technik.** [High mountain climate and technology.] *Naturwissenschaften*, 22:381–384, **1934.** refs. **DLC**—Increasing use of mountains makes a knowledge of their climate more important. Discusses applications to hydroelectricity, mountain roads, air travel and health. (*Same item as* 2K–163, Nov. 1951, *MAB.*) *Subject Headings:* **1. Mountain meteorology 2. Applied climatology.**

1940

5J–3 551.521.1:62

Moon, P., **Proposed standard solar-radiation curves for engineering use.** *Franklin Institute, Philadelphia, Journal*, 230(5):583–617, Nov. **1940.** 17 figs., 5 tables, 37 refs. **DLC**—Data obtained by various investigators on the spectral distribution of sunlight outside the earth's atmosphere are compared and on the basis of this comparison, a proposed standard curve expressed in absolute units is recommended for engineering problems concerned with sunlight. Data for atmospheric transmission are given to enable spectral irradiation curves to be computed for any place, time and height above sea level. A set of proposed standard curves are computed for sea level and give good agreement when checked against independent data on total irradiation, ultraviolet irradiation, illumination and color temperature. *Subject Headings:* **1. Solar radiation 2. Engineering.**

1943

5J–4 551.5:62

The applications of meteorology to industry. *Royal Meteorological Society, Quarterly Journal*, 69(302):245–250, Oct. **1943.** **DLC**—Account of a discussion, opened by J. F. SHIPLEY, dealing with air conditioning as applied to dwelling houses, industries such as printing, paint and electric, and the effect of atmospheric pollution and dust on apparatus involving electric contacts. W. N. MCCLEAN referred to the part of meteorology in hydro-electric developments. *Subject Heading:* **1. Industrial meteorology.**

1945

5J–5 551.524.37:628.15

Boden, W., **Notes on the prevention of frost failures in water distribution systems.** *Water and Water Engineering*, 48(594):569–570, Oct. **1945.** 11 refs. **DLC**—Periods of frost cause considerable loss of water through burst pipes. Possible methods of minimizing frost damage are discussed briefly. *Subject Headings:* **1. Frost damage 2. Water supply.**

5J–6 627.51(51)

Szeto, W., **Hydraulic problems in China.** *Water and Water Engineering*, London, 48(592): 439–459, Aug. **1945.** 8 figs., 6 tables, 11 refs. **DLC**—The great rivers of China, especially the Hwang Ho, present great difficulties of control because of their range of flow and loads of sediment. The Hwang Ho, Yangtze and Hwai are described and problems of flood control, mainly by dikes, are discussed. Economic uses include transportation, irrigation and possible hydroelectric power. *Subject Headings:* **1. Flood control 2. China.**

1946

5J–7 551.5:6

Drake, Lawrence, **Putting the weather to work for you.** Wash., D. C., American Retail Federation, **1946.** 28 p. 6 figs. **DWB**—Popular account of the objects of the U. S. Weather Bureau's weather advisory program, and illustrations of a great variety of services which it can render (with parallel accounts of war services). One illustration shows "dollars-and-cents side of a heat wave." Other effects of weather on sales, etc. are discussed. *Subject Headings:* **1. Applied meteorology. I. U. S. Weather Bureau.**

1947

5J–8 551.586:67 551.5:67

Bates, C. C. and Glenn, A. H., **Meteorological engineering and the oil industry.** *Oil Weekly*, 125(12):33–34, May 19, **1947,** and 125(13):42–46, 52, May 26, **1947.** 14 figs., table. **DWB**—Application of experience gained during the war in meteorology, hydrology, oceanography and soil mechanics to solution of problems confronting the oil industry. Exploration by ground, in shallow waters or by air requires knowledge of climate, wave conditions, flying conditions, visibility, cloudiness, temperature, frosts, soil trafficability, humidity, surface winds and precipitation. For long range planning, frequencies of climatic elements enable estimates to be made of the success of operations in any season or place, thus concentrating efforts where the most effective use can be made at that season. For immediate operations the synoptic forecast (for soil, flying or wave-surf conditions)

will increase efficiency. Many examples given; charts and graphs taken from Air Weather Servic and Hydrographic Office Reports illustrate methods of presentation for many elements and mani parts of the earth. (*Same item as* 3–133, March 1950, *MAB.*) *Subject Headings:* **1. Applied clima tology 2. Meteorological engineering.**—*M.R.*

5J–9 551.50

McComber, Camilla, **Weather 1212. Scientific forecasting, climatic statistics save America business millions.** *Federal Science Progress*, Wash., D. C., 1(1):20–23, Feb. **1947. DWB**—Th importance of telephone weather recordings giving short notice and extended forecasts for suc enterprises as construction, handling certain types of merchandise, various industries, agriculture recreation, navigation, aviation, etc. is described in a popular article pointing out the accomplish ments of the Weather Bureau in this field. The photographs and notes, following the article illustrate various activities dependent on weather. (*Same item as* 3.5–77, May 1952, *MAB*) *Subject Headings:* **1. Telephonic weather forecasts 2. Industrial climatology.**—*G.T.*

1948

5J–10 551.508:551.573:661.4

Bonython, C. Warren, **Instruments in the study of solar saltfields.** *Australian Journal o Instrument Technology*, 4(5):209–220, Sept. **1948.** 5 figs., 7 refs. **DBS**—The process of extractin salt from sea water at Dry Creek, S. Australia, is described. Problems of estimating evaporatio from large sheets of brine are discussed. Instruments in use in the saltfield include raingages, we and dry-bulb thermograph, anemographs and solarimeter. Instruments to measure evaporatio by method of THORNTHWAITE and HOLZMAN are in process of installation. *Subject Heading* **1. Evaporation 2. Salt production 3. Australia.**

5J–11 551.50

Bregman, G. R., **Ob effektivnosti prognoza.** [Effectiveness of forecasts.] *Meteorologiia i Gidrologiia*, No. 8:3–16, Aug. **1948.** 2 figs., 12 eqs. **DLC**—The author states that the planne economy of the Soviet Union has placed new requirements on the weather forecast service. Besid preventing undesirable effects of certain meteorological and hydrological phenomena, forecasts mu contribute to the optimum utilization of natural conditions. The evaluation of the methods an results of the forecasts must be changed accordingly. Besides certain mean degrees of accurac the requirements for the forecasts are reliability in space, i.e., in relation to regional or local physic and geographical conditions, and, i.e., in relation to various climatic cycles and seasons for lon range forecasts and to sudden change in processes and phenomena for short range forecasts. Mor over, a new criterion for satisfactory forecasts is introduced—effectiveness, which is evaluate according to its advantage for a specific economic activity. The effectiveness of forecasts has to l expressed in money value. The author presents an analysis of effectiveness of forecasts dependi on one of three kinds: forecasts contributing to future planning and to achievement of current ec nomic tasks, forecasts contributing only to current activity and forecasts containing warning dangerous phenomena. For each, specific formulas are worked out. (*Same item as* 3.5–75, M 1952, *MAB.*) *Subject Headings:* **1. Weather forecasting 2. Industrial meteorology 3. Foreca accuracy.**—*C.K.*

5J–12 551.515:551.543:622.

Hosler, C. L., **Atmospheric surface pressure related to coal mine explosions.** *American Ge physical Union, Transactions*, 29(5):607–612, Oct. **1948.** 8 figs., 7 refs. **DWB**—Investigation w made to determine whether modern mine ventilation eliminated the hazard caused by sudden fa in atmospheric pressure. The synoptic situations preceding explosions that occurred in the previo twelve years are studied and give strong indications what there is a definite relationship betwe sharp pressure falls due to cyclogenesis, deep troughs, deepening of stationary depressions, etc., a with explosions in coal mines. *Subject Headings:* **1. Atmospheric disturbances 2. Pressure chang 3. Coal mining.**

1949

5J–13 551.509.9:66

Bates, Charles C., **The status of applied meteorology in the United States in the post-w period.** *American Meteorological Society, Bulletin*, 30(6):199–203, June **1949.** photo. **MH-BH** Describes the history of private meteorological consulting work in industry, causes of its slow progr and prospects for the future. (*Same item as* 2.6–36, June 1951, *MAB.*) *Subject Heading:* **1. Appli meteorology.**—*C.E.P.B.*

5J–14 551.5

Gosline, Carl A., Jr., **The role of the meteorologist in a large company.** *American Meteorologi Society, Bulletin*, 30(4):119–123, April **1949.** 3 figs., table, photo. Summary p. 123. **DWB**

After listing some of the reasons a large company employs a meteorologist, the author discusses types of problems an industrial meteorologist might be called on to solve: 1) waste disposal from stacks, 2) weather data for management or planning information and 3) weather data for design information. *Subject Heading:* **1. Applied meteorology.**—*M.L.R.*

5J–15 551.5:62:37

Malkus, Joanne Starr, **Meteorology for engineers.** *American Meteorological Society, Bulletin*, 30(9):310–313, Nov. 1949. 2 figs. **DWB**—Many ways in which an engineer can apply knowledge of meteorology are cited. Also basis on which meteorology course is organized in the Physics Department of the Illinois Institute of Technology is explained. (*Same item as* 2.3–8, March 1951, *MAB.*) *Subject Headings:* **1. Industrial meteorology 2. Teaching of meteorology.**—*M.R.*

5J–16 551.501.3 551.571:001

*Sheppard, P. A., **The physical properties of air with reference to meteorological practice and the air-conditioning engineer.** *American Society of Mechanical Engineers, Transactions*, 71:915–919, 1949. table, eqs. **DLC**—Summary of reports of IMO subcommission appointed to recommend a set of values of physical functions and constants in common meteorological use. It covers temperature scales, composition of atmosphere, calorie equivalents, compressibility, enthalpy, entropy, saturation vapor pressure, and a number of definitions and specifications of water vapor in the atmosphere. *Subject Headings:* **1. Constants 2. Definitions 3. Units.**

1950

5J–17 551.582.2:62

Bernard, Merrill, **The role of climatology in engineering.** *American Meteorological Society, Bulletin*, 31(6):194–196, June **1950. DWB, MH-BH**—Tabulated frequencies of the occurrence of weather elements, such as rain, snow, heat, wind and humidity observed over a decade or more, constitute a tool for design of industrial and engineering structures and other long range planning. Such probabilities really constitute a "forecast." The importance of having the data readily compilable (on punched cards) is stressed. (*Same item as* 9–136, Sept. 1950, *MAB.*) *Subject Headings:* **1. Climatology 2. Industrial meteorology.**—*M.R.*

5J–18 551.58(02)

†Brooks, C. E. P., **Climate in everyday life.** London, Ernest Benn, **1950.** 314 p. 34 figs., 26 tables, 3 append. (tables, 155 refs.) **DWB**—A book planned to provide the practical information most often required about climate. **Pt. I, Living with the climate,** discusses the various types of climate and their effect on human efficiency, comfort and health. World charts are given for mean air and wet-bulb temperatures, Jan. and July. Subjects discussed include water-, wind- and sun-power, water supply and transport, including hindrance by snow cover and sea ice. Chap. 2 discusses siting and design of houses and factories in relation to climate (with table of sunshine at 107 places), lighting, purity of air, local climates and wind structure. In Chaps. 3–7 the peculiarities of different climates are set out from the human point of view. Pt. II, **Climate as an enemy,** discusses climate and the deterioration of materials, including extreme temperatures in the sun and effect of temperature and humidity on corrosion and moulding; atmospheric pollution; and climatic "accidents"—heavy rain, floods, hail, snow, ice storms, lightning, tornadoes, squalls, hurricanes and typhoons. Pt. III, **Control of climate,** includes heating, air conditioning, lighting, clothing, rain-making and fog dispersal, prevention of hail, protection from lightning, frost prevention and windbreaks. Appendix I gives climatic statistics and "thumb-nail" sketches for over 270 places in all parts of the world. (*Same item as* 2.1–149, Jan. 1951, *MAB.*) *Subject Headings:* **1. Climatology 2. Architecture 3. Industrial climatology.**

5J–19 551.5:621.3 551.5:69

Brunt, Sir David, **Meteorology and engineering.** (In: Royal Meteorological Society, **Centenary Proceedings, 1950.** p. 235–238.) **MH-BH**—Discusses meteorological aids in generation and transmission of electricity (location and design of power stations to avoid polluting the air, cooling towers, damage to transmission lines, variation of load), wind pressure on structures, heating of buildings. Very general. (*Same item as* 2.3–9, March 1951, *MAB.*) *Subject Headings:* **1. Industrial meteorology 2. Electrical engineering 3. Building construction.**

5J–20 551.5:550.83

Glenn, Alfred H. and Bates, Charles C., **The meteorological and oceanographic aspects of geophysical prospecting.** *Geophysics*, Menasha, Wisc., 15(2):247–256, April **1950.** 2 figs., 2 tables, 12 refs. **DLC, DGS**—The authors discuss the relationship of the professional consulting meteorologist to the Weather Bureau and special applications of industrial climatology and of oceanography to offshore oil drilling operations. The application of short range forecasting and of

punched card techniques to forecasting weather and wave conditions required for special operation for scheduling work areas, for planning exploration and for determining soil trafficability are co sidered. The importance and need for investigating microseisms, the dynamics of sedimentati with special reference to tides, wave refraction and current patterns are stressed. (*Same item* 2.8–10, Aug. 1951, *MAB.*) *Subject Headings:* **1. Industrial meteorology 2. Geophysical prospectin —I.L.D.**

5J–21 551.508.79:551.579

Lee, J. D., **Hydrology and its applications in engineering (with particular reference to civ engineering problems).** *Royal Meteorological Society, Canadian Branch,* [*Publications*], 1(6), Ju **1950.** 9 p. 7 figs. Mimeo. **DWB**—Description of the hydrograph for gaging stream flow, an the components of the flow. As an example, flow of Moira River for 1940 is shown. Flow followin a peak is represented by $q_2 = q_{1e}^{-0.072t}$, t = time in days. Frequency analysis of peak floods and storm rainfalls is described, and allowances for snow storage and evapotranspiration discusse leading to the hydrologic cycle. A reference is made to ice jams in relation to temperature. *Subje Headings:* **1. Hydrographs 2. Flood frequencies 3. Civil engineering 4. Canada.**

5J–22 551.5

Lorente Pérez, José Maria, **El gran campo de aplicación de la meteorologiâ.** [The wide fie for the application of meteorology.] *Revista de Geofisica,* Madrid, 9(35):248–261, July–Sept. **195** ref. **DWB**—A discussion of the applications of meteorology to human affairs. A long list problems is given, from mental and physical influence on man through effect on soil, plants, anima building and air conditioning, town planning, transportation, tourism, sport and many forms industry to war. (*Same item as* 2.5–9, May 1951, *MAB.*) *Subject Heading:* **1. Applied meteorolog —C.E.P.B.**

5J–23 551.5(02):6 551.

Maurain, Charles Honoré, **La météorologie et ses applications.** [Meteorology and its a plications.] Paris, Flammarion, **1950.** 255 p. 19 figs., refs. **DWB, DLC**—A nontechnic treatise on the history and organization of meteorological services, especially in France, on t general concepts of radiation, temperature, general circulation, water vapor in the atmosphe weather forecasting and climatology. Many modern applications have been introduced, such cloud seeding, atmospheric pollution control, radio transmission as affected by meteorological con tions, urban climatology, etc. (*Same item as* 3.8–29, Aug. 1952, *MAB.*) *Subject Headin* **1. Applied meteorology 2. Climatology 3. Textbooks.**—*M.R.*

5J–24 551.46:62 551.5(26)

Redfield, A. C., **Some applications of oceanography to engineering problems.** *Boston Soci of Civil Engineers, Journal,* 37:275–295, July **1950.** 11 figs., 16 refs. **DLC**—Reviews aids giv by oceanography and marine meteorology to navigation, under-water communication proble protection of shores from sea erosion and to petroleum and sanitary engineering, and briefly discus power development. *Subject Headings:* **1. Marine meteorology 2. Oceanography 3. Engineeri**

1951

5J–25 551.509

Bijvoet, H. C. and Bleeker, Wouter, **The value of weather forecasts.** *Weather,* 6(2):36– Feb. **1951.** 2 figs., 2 refs., eqs. **DWB**—Discusses the circumstances in which it would pay business to take account of weather forecasts, balancing the loss due to weather against cost precautions. It is concluded that precautions based on forecasts would not necessarily save mon (*Same item as* 2.6–25, June 1951, *MAB.*) *Subject Headings:* **1. Weather forecasting 2. Industr meteorology.**—*C.E.P.B.*

5J–26 551.574.42:656:621

British Glaciological Society, **Symposium on the deposition of ice on exposed surfaces.** Hardy, J. K., **The physics of the deposition process;** 2. Coombs, D. H., **Icing on electric railwa** 3. Lilley, G. G., **Icing in cold stores** and 4. Sutherby, F. S., **Icing problems on ships.** *Journa Glaciology,* 1(10):536–548, Oct. **1951.** Discussion p. 548–550. **DWB**—The first paper consid the effect of frost on heat transfer in refrigeration processes and the problem of icing on aircra The second paper is concerned with the interference with the collection of current caused by formation on top-contact current rails, and methods of removal. Meteorological Office foreca are supplied to London Transport to enable de-icing precautions to be taken. The third pa examines three sets of conditions in the cold storage industry where ice formation is harmful: (a) the inside surfaces of cold rooms; (b) on sealing surfaces of cold store doors and (c) on metals of h

hermal conductivity where these penetrate insulation. The fourth paper deals briefly with ice accumulation on ships. *Subject Headings:* **1. Icing research 2. Temperature control 3. Transportation 4. Refrigeration.**

5J–27 551.58:6

Landsberg, Helmut E. and Jacobs, Woodrow C., **Applied climatology.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 976–992. 8 tables, 8 refs.) **MH-BH**— Acomprehensive review of the problems and techniques of applied climatology and of the nature of the available and required data of applied climatology. The specific climatic data needed for various activities, the extent of available climatic data and data sources, required additional climatic data, the problem of interpolation of data, of substitution of climatic elements and of reduction of series, etc. are discussed critically. The various types of problems with which applied climatology is concerned, namely: 1) designs and specifications, 2) location and operation of facilities or equipment, 3) planning of operations and 4) the relations between climate and biological processes are described. A detailed discussion of the techniques of applied climatology is presented. These techniques, which involve various combinations of climate, space and time, are classified in the following groups: 1) single point—simple time series—single climatic element (insurance against rain, hail, etc.); 2) single point—single time series—multiple climatic element (design and specification for protection against the environment); 3) single point—complex time relation—single climatic factor (intensity-duration problems such as solar radiation as related to design of windows, etc.: probability of frost damage, etc.); 4) single point—complex time relation—multiple climatic element (deterioration of materials); 5) multiple point or areal problems—simple time series—single climatic element (marketing of "weather goods" on a national basis, etc.); 6) multiple point or areal problem—simple time series—multiple climatic element (planning for areal mapping of large areas) and 7) multiple point or areal problems—complex time series—multiple climatic element (agricultural land use in relation to climate). (*Same item as* 3.9–10, Sept. 1952, *MAB.*) *Subject Headings:* **1. Applied climatology 2. Compendium articles.**—*I.L.D.*

5J–28 551.509.52

Shisler, Karl, **An initial solution to the hurricane problem of the offshore oil operator in the Gulf of Mexico.** *American Meteorological Society, Bulletin,* 32(3):79–88, March **1951.** 8 figs., 1 table, 5 refs. **MH-BH**—The necessity for adequate warning of the exact time and strength of hurricane onset to allow for shutting down offshore oil drilling in the Gulf of Mexico is propounded. A novel series of charts is presented for use in calculating average evacuation period for hurricanes originating in the Atlantic, Caribbean or Gulf, respectively. Techniques followed during a typical storm are outlined wherein knowledge of synoptic meteorology, climatology and oceanography are combined to give optimum advice. (*Same item as* 2.9–48, Sept. 1951, *MAB.*) *Subject Headings:* **1. Industrial forecasting 2. Hurricane warnings 3. Gulf of Mexico.**—*M.R.*

1952

5J–29 551.571:62

Bleasdale, A., **An example in applied climatology.** *Meteorological Magazine,* London, 81(965): 345–347, Nov. **1952.** 4 refs. **DWB**—Industry requires humidity mainly as wet-bulb temperature. The example quoted is the use and design of cooling towers. The need for statistics of wet-bulb temperature is emphasized. *Subject Headings:* **1. Humidity effects 2. Cooling towers.**

5J–30 551.58:6

Reichel, Eberhard, **Technische Klimatologie.** [Technical climatology.] *Technik,* Berlin, 7(10):619–622, **1952.** 15 refs. Also: **Technoklimatische Grundlagenforschung.** [Technical climatological basic investigation.] *Elektrotechnische Zeitung,* 71:164–165, **1950. DLC**—Technical climatology is the basis for testing materials, planning installations, etc. The statistical material should include frequency tables as well as means and extremes. The applications described include: 1) testing materials, to be exposed in the open, for corrosion by temperature, humidity, wind, etc.; 2) water, wind and sun as sources of energy; 3) siting factories; 4) electrotechnology (lightning risk, damage to exposed conductors); 5) building of high factories, streets, railways, hydrological installations, airfields; 6) health and 7) agriculture. The second paper sets out a research program and advocates collaboration between industrial experts and weather services. *Subject Heading:* **1. Applied climatology.**

5J–31 551.5:62

Veryard, R. G., **Meteorology and engineering.** *The Woman Engineer,* London, 7(7):12–15, 20, **1952. DLC**—A popular article which first outlines the organization of the Meteorological Office. The applications of meteorology to transport, power, hydrology, mining, radio, structural engineering and industry are briefly considered. *Subject Heading:* **1. Engineering meteorology.**

1953

5J–32 551.5:6

Jehn, K. H., **Some aspects of engineering meteorology.** *Scientific Monthly*, 76(1):3–10, Jan **1953.** 8 photos, 32 refs. **DWB**—After defining "engineering meteorology" as "the application o meteorological principles and practices to certain engineering problems" in contrast to "meteoro logical problems," the author discusses in general terms the design and forecasting aspects of me teorology or climatology in connection with engineering problems as construction and operation of hy drological structure (determination of maximum flood; water-level forecasting); release of industria waste (atmospheric pollution); oil industry, particularly in Gulf Coast locations (wave and swe conditions); architecture (microclimate); highway and electrical power-line construction (state o atmosphere); aircraft design, etc. Suggestions are made to improve present methods of trainin for engineering meteorology. (*Same item as* 4.9–23, Sept. 1953, *MAB.*) *Subject Heading:* **1. En gineering meteorology.**—*G.T.*

5J–33 551.5:681.1

Lloyd, H. Alan, **Horology and meteorology.** *Journal suisse d'Horlogerie et de Bijouterie*, Lau sanne, (Eng. ed.), 78(11/12):371–381, Nov./Dec. **1953;** 79(1/2):46–56, Jan./Feb. **1954. GB-MO**— The article traces historically a three-fold relationship between horology and meteorology: (1) th application of timepieces to the recording of pressure variations, (2) the effect of variations of at mospheric density on timepieces and (3) the utilization of pressure changes as a motive force for clock. The paper is well-illustrated with photographs of outstanding timepieces, including Sir Christopher Wren's "Weather clock," Cox's "Perpetual motion clock" and the first recordin barograph by Alexander Cumming. *Subject Headings:* **1. Horology 2. Meteorology 3. Meteoro logical instruments.**

5J–34 551.58

Illinois. Univ. Dept. of Geography, **Climatic criteria defining efficiency limits for certa industrial activities.** Contract AF 19(604)-416, Final Report, [1953]. 20 pieces (including one pie which consists only of covers for section in which no report was submitted). figs., tables. **DWB**— This series of 28 [i.e., 27] reports covers a multitude of problems relating to the effect of clima (and the limits of operating efficiency) on railroad transportation, industrial construction, electr power, iron and steel manufacture, oil industry from exploration to refining, chemical industr synthetic rubber and tire industry, motorized military equipment, aircraft industry and locomotiv railroad car and submarine construction. Severely cold rather than warm or humid climates we considered. Three types of conditions were recognized: (1) those which can be ignored, (2) tho which decrease efficiency but which can be compensated for and (3) those which prevent or preclu operation. *Subject Headings:* **1. Industrial climatology 2. Arctic industry 3. Severe climate I. Contract AF 19(604)-416 II. Russell, Joseph A. III. Waters, John W. IV. Booth, Alfred V. V. Lemon, Ronald.**—*M.R.*

B. EFFECT OF CLIMATE AND WEATHER ON MATERIALS

1935

5J–35 551.571:629

Kline, G. M., **Moisture relations of aircraft fabric.** *U. S. National Bureau of Standards, Journ of Research*, 14(1):67–84, Jan. **1935.** 18 tables, 4 figs., 8 refs. **DLC**—Both airplane and balloo fabrics are subjected to varying humidities to determine the amount of water which the aircr will be required to support under varying atmospheric conditions. Results are given for airpla fabrics doped with cellulose nitrate and also with cellulose acetate. Both gas-cell fabric and u paraffined gas-cell fabric are also considered, and the growth of mold on gas-cell fabrics at hi humidities results in a recommendation that a fungicide be added to the normal gelatin-latex coat given to such fabrics. *Subject Headings:* **1. Humidity effects 2. Weathering of materials 3. Aer nautical engineering.**

1937

5J–36 551.510.42:620

Digby, W. P., **Photometric study of atmospheric pollution.** *Royal Meteorological Soci Quarterly Journal*, 63(269):163–180, April **1937.** 14 figs., tables. Discussion p. 177–180. **DWI** Observations of tarnishing of various metals exposed to the atmosphere, by measuring reflect of light on to photoelectric cells, are described. Exposures ranged up to 400 hours. Differences tween rural, London and NE coast industrial area were very marked, the loss of reflecting power at 120 hours in Dec. being: Rural, silver 15.7, copper 39.5, nickel 40.7; London, 35.0, 63.0, 53.4;

coast, 42.4, 69.0, 50.7. In London fogs, reflection of polished copper fell by 38–50% in 5 hours. Tarnishing was roughly proportional to amount of sulphur in the air. *Subject Headings:* **1. Atmospheric pollution measurement 2. Corrosion.**

1939

5J–37 551.510.42:69

Schaffer, R. J., **Atmospheric pollution in its bearing on the weathering of stone and similar building materials.** *Great Britain. Dept. of Scientific and Industrial Research, Investigation on Atmospheric Pollution, Report,* 25:111–121, **1938/39.** 6 plates. **GB-MO**—Report discusses: discoloration by tarry constituents of soot as it affects different materials such as limestone and sandstone; chemical effects on limestones and slates, of acids in air and rainwater, and possible remedial measures by surface treatment with a preservative and washing with clean water. Photographs show effects of pollution on buildings in London, and microsections of weathered surfaces. (*Same item as* 3G–183, July 1952, *MAB.*) *Subject Headings:* **1. Atmospheric pollution 2. Weathering of materials.**

1940

5J–38 551.508.71:691.3

Gause, G. Rupert and Tucker, John, **Method for determining the moisture condition in hardened concrete.** *U. S. National Bureau of Standards, Journal of Research,* 25(4):403–416, Oct. **1940.** 13 figs., 3 tables, 8 refs. **DLC**—The electric hygrometer developed for radiosonde use is described and the method is given for its use in measuring the relative humidity in cavities within concrete. Measurements were made inside 12-in. concrete cubes over a period of 300 days. Results are given for coated and uncoated specimens. *Subject Headings:* **1. Hygrometers 2. Concrete.**

5J–39 551.524:629.13

†Rosenberg, S. J., **Effect of low temperatures on the properties of aircraft metals.** *U. S. National Bureau of Standards, Journal of Research,* 25(6):673–701, Dec. **1940.** 25 figs., 3 tables, 16 refs. **DLC**—The tensile properties, hardness and impact resistance of ferritic steels, austenitic stainless steel, nickel alloys and light metal alloys were determined for temperatures down to −78°C. The only adverse effect noted was a decrease in the impact resistance of the ferritic steels as temperature decreased. *Subject Headings:* **1. Temperature effects 2. Aeronautical engineering.**

5J–40 551.571:677.41

Schenke, E. Max and Howard E. Shearer, **Strength and elongation of silk yarns as affected by humidity.** *U. S. National Bureau of Standards, Journal of Research,* 25(6):783–790, Dec. **1940.** 2 figs., 6 tables. **DLC**—Silk hosiery yarns of varying number of threads and turns of twist per inch, were tested for breaking strength and breaking elongation at 70°F following various periods of exposure in humidities from 33–86%. Little change in strength was noted between 33 and 55% but strength decreased at higher humidities. *Subject Headings:* **1. Humidity effects 2. Silk industry.**

5J–41 551.524.3:693.5

Thomlinson, J., **Temperature variations and consequent stresses produced by daily and seasonal temperature cycles in concrete slabs.** *Concrete and Constructional Engineering,* London, 35:298–307, 352–360, **1940.** 22 figs., 2 tables, 5 refs., 20 eqs. **DBS**—The theory of temperature variation at any depth due to a simple harmonic variation of surface temperature is set out. The resulting internal stresses in a concrete slab are calculated and shown to increase with thickness of the slab. Stresses due to end restraint decrease with increasing thickness. Expressions are found for bending stresses due to prevention of warping or curling. The equations of stress are then applied to cases of partial restraint. The effect of reinforcement with steel is considered in one specific case and it is shown that reinforcement has little effect on the stresses produced by temperature variations; its real usefulness is to prevent open cracks. *Subject Headings:* **1. Temperature effects 2. Concrete.**

1941

5J–42 551.521.1:691

Cottony, H. V. and Dill, R. S., **Solar heating of various surfaces.** *U. S. National Bureau of Standards, Building Materials and Structures, Report BMS,* 64, Jan. **1941.** 5 p. fig., 2 tables. **DLC**—Measurements were made of temperature attained by several materials and colored surfaces that might be used on roofs, when these were exposed to solar radiation and to night cooling. A lamp-black surface was the warmest tried and glossy white the coolest. Aluminium, green and red roll roofing materials all attained temperatures almost as high as the lamp-black surface. An aluminium foil-covered surface cooled the least at night. Full results are tabulated. *Subject Headings:* **1. Solar radiation effects 2. Building materials.**

5J–43 551.524:6

Ross, C. W., **Thermal expansion of clay building bricks.** *U. S. National Bureau of Standard Journal of Research*, 27(2):197–216, Aug. 1941. 3 figs., 8 tables. **DLC**—One brick of sand-lim 9 of fire-clay and 61 of clay and shale were used as samples. The coefficients of expansion wer measured over the range −10°C to +40°C. The smallest coefficient was found with fire-clay brick The apparatus and test procedure is described and results are tabulated. *Subject Headings:* **1. Build ing materials 2. Temperature effects.**

1942

5J–44 551.5:620.

Harrison, W. N. and Moore, D. G., **Weather resistance of porcelain-enameled iron structur units.** *U. S. National Bureau of Standards, Journal of Research*, 28(6):735–754, June 1942. figs., 4 tables, 10 refs. **DLC**—Data were collected on the weathering resistance over a period of o year of various types of porcelain enamel in four different climatic locations. Full mat enam were found unsuitable for architectural use where appearance was important, because of fadin Weathering was found to result in minute pitting of non-acid-resistant enamel surfaces. This w much reduced by a thin overglaze of clear, acid-resistant enamel. Weathering was more pronounce at the locations where there was a relatively high concentration of combustion gases. In no cas however, did the enamel fail to give protection to the underlying iron from rust. *Subject Headin* **1. Weathering of materials.**

5J–45 620.19:631

Logan, K. H., **Soil-corrosion studies 1939. Coatings for the protection of metals unde ground.** *U. S. National Bureau of Standards, Journal of Research*, 28(1):57–71, Jan. 1942. tables. **DLC**—The results are given of tests to show the protective value of metallic and no metallic coatings after exposure to soils for periods between 2 and 16 years. Zinc, lead, tin, bituminous and nonbituminous coatings were included in the test. Also: **Ferrous and non-ferro corrosion-resistant materials.** *Ibid.*, 28(3):379–400, March 1942. 2 figs., 22 tables. **DLC**—T paper reports the conditions of specimens of ferrous metals and alloys, and copper and copper alloy zinc and lead, exposed to various soils for seven years, and of other materials exposed for differe periods. Increase of chromium and nickel contents in ferrous metals made them highly resista to soil corrosion. *Subject Heading:* **1. Soil corrosion.**

1943

5J–46 551.584.9:629

Knight, R. A. G.; Doman, L. S. and Newall, R. J., **Temperature and moisture content conditio in wooden aircraft wings in England, and their influence on the durability of glued joints.** *G Britain. Ministry of Aircraft Production, Scientific and Technical Memoranda* No. 1/43-F.P **1943.** 24 p. 2 figs., plate, 18 tables. Mimeo. **GB-MO**—Measurements were made on the surf and inside a Phillips and Dowis Master wing. Methods and results are given. The worst conditio likely to be subjected for a few hours were estimated to be 160°F and 60% R.H. when the wing dry, and 130°F and 9% when wet. Resin and glues tested for durability showed that many ur formaldehyde resin glues would successfully withstand conditions likely to be encountered in Engla *Subject Headings:* **1. Aeronautical engineering 2. Microclimates.**

1944

5J–47 551.584.9:629

Browne, F. L.; Downs, L. E.; Laughan, D. F. and Schwebs, A. C., **Study of temperature a moisture content in wood aircraft wings in different climates. First progress report.** *U. S. Fo Service. Forest Products Laboratory, Madison, Wisconsin, R [Series]*, No. 1597, Feb. **1944.** 1 12 figs., 4 tables. Mimeo. **NACA**—The report details methods and results of temperature a moisture content measurements made in right-hand wings of Anson aircraft at Madison and Tuc between June and October 1943. The highest temperature observed was 215°F at Tucson and 17 at Madison. *Subject Headings:* **1. Microclimates 2. Aeronautical engineering.**

1945

5J–48 551.524.37:69

Collins, A. R., **The destruction of concrete by frost.** *Institution of Civil Engineers, Lond Journal*, 29–41, Oct. **1945.** 10 figs., 3 tables. **DLC**—The mechanism of the failure of conc when subjected to temperatures below freezing point is described in some detail. Field and l oratory work is given in support of the explanation that the mechanism is similar to frost heavin soils with the segregation of ice into layers. Cooling to a temperature several degrees below freez

over a prolonged period contributes to severe damage. Improvements in frost-resistance can be obtained by use of admixtures. *Subject Headings:* **1. Frost damage 2. Concrete.**

5J–49 620.19

Hudson, J. C., **The corrosion of iron and steel. The work of the corrosion committee of the Iron and Steel Institute and the British Iron and Steel Federation.** *Journal of Scientific Instruments*, 22(12):231–235, Dec. **1945.** 4 figs., 4 refs. **DLC**—This joint research committee was set up in 1928, with the principal aim of eliminating rust. The work of the five sub-committees on: (I) Protective coatings, (II) Atmospheric corrosion, (III) Marine corrosion, (IV) Industrial waters and (V) Buried metals is described. In the case of atmospheric corrosion the controlling factors are the relative humidity and the degree of pollution, a combination of both being necessary for marked corrosion. *Subject Heading:* **1. Corrosion.**

5J–50 620.19

Vernon, W. H. J., **Controlling factors in atmosphere and immersed corrosion.** *Journal of Scientific Instruments*, 22(12):226–230, Dec. **1945.** 4 figs., 8 refs. **DLC**—The author first considers immersed corrosion and goes on to consider atmospheric corrosion, which he classifies into metal-liquid and metal-gas reactions. The rate of supply of water, i.e., the relative humidity of the atmosphere, is seen as a controlling factor in some metal-liquid reactions, together with the influence of disperse systems in the atmosphere. A critical relative humidity is seen above which reactions are quickened. Below this critical humidity at which visible "filming" of the specimen can be noted there occurs the metal-gas reactions. Relative humidity is no longer a controlling factor below the critical value. The air-formed oxide film and its physical properties is now in complete control. *Subject Heading:* **1. Corrosion.**

1946

5J–51 551.58:620.19

Brooks, C. E. P., **Climate and the deterioration of materials.** *Royal Meteorological Society, Quarterly Journal*, 72(311):87–97, Jan. **1946.** 3 figs., 2 tables, 8 refs. **DWB**—A discussion of effects of heat and moisture on materials. The maximum temperature taken up by a body exposed to the sun is calculated for different latitudes and for surfaces of different colors. Effects of temperature on speed of chemical action, viscosity and organic action are considered. Combined deterioration index of temperature t°C and relative humidity H is represented by $\Sigma 1.054^t(H-65)/10$ and a world map given. *Subject Headings:* **1. Industrial climatology 2. Weathering of materials.**

5J–52 551.524:551.571:629.13

Greenhill, W. L., **Temperatures and moisture content attained by wooden aircraft in service in Australia.** *Australia. Council for Aeronautics, Report* ACA-23, April **1946.** 64 p. 34 figs., 14 tables, 10 refs. **DLC**—The report is divided into five parts. The first gives experimental details, meteorological data, and results of ground tests with Anson aircraft wings. Pt. II gives similar details for a Mosquito aircraft wing. Pt. III describes flight tests made with both types of aircraft to measure the rates of change of temperature and moisture content when leaving the ground. Pt. IV gives data on the effect of various surface finishes and Pt. V deals with laboratory work on the loosening of screws and brads with changes in moisture content. *Subject Headings:* **1. Aeronautical engineering 2. Temperature effects 3. Humidity effects.**

5J–53 551.506:691.33

Grimm, G. O., **Ueber das Verhalten von härtbaren Kunststoffen im Wetter.** [On the durability of compressible artificial materials exposed to weather.] *Schweizer Archiv für angewandte Wissenschaft und Technik, Zürich*, 12:311–322, **1946.** 11 figs., 12 tables. **DLC**—Various materials: wood pulp, organic fiber, woven strips, asbestos fiber, all cemented with phenol resin, and cellulose dust cemented with other resins, were exposed to the weather near Zürich in June 1943 through August 1945 and to mechanical stresses. The results are set out in a number of tables. Tension points on the side exposed to the weather were found to be especially liable to damage, which could be avoided or minimized by suitable methods of construction. The weather side of compressed materials showed practically none of the corrosion to which metals are subject. The conditions of compression greatly affect weather erosion but no general rules could be laid down. Weather influences can decrease the permanence, but long-contained stresses should not exceed one-fifth of the original strength. Some of the changes brought about in artificial materials by weather are temporary, e.g., wetting by rain, but others are permanent, e.g., surface weathering. *Subject Headings:* **1. Weathering of materials 2. Artificial building materials.**

5J–54 551.581:621.396

Healy, C. P., **Deterioration of radio equipment in damp tropical climates and some measures of prevention.** *Amalgamated Wireless, Australasia, Ltd. Sydney, A.W.A. Technical Review,*

7(2):103–129, Dec. 1946. 21 figs., 3 tables. **DLC**—The paper summarizes researches made by th Amalgamated Wireless (Australasia), Ltd., and other laboratories made up to 1943 into problems o materials used in radio communication and of their protection. Deteriorations due to moistur and to organic growths are described together with the laboratory methods for testing material under damp tropical conditions. *Subject Headings:* **1. Tropical climatology 2. Radio equipment.**

1947

5J–55 620.1

Jimeno, E., **El problema de la corrosión.** [The problem of metal corrosion.] Madrid, Mini sterio de Marina, Instituto Español de Oceanografía, **1947.** 237 p. 5 figs., 2 tables. **DA, DN-H** —The author reviews some of the earlier work done by institutions in various countries and stresse the importance of finding solutions to its different aspects of the problem. The types of corrosio are considered in some detail, and methods described for protection against corrosion. *Subje Heading:* **1. Corrosion.**

5J–56 551.5:620.19:6

Jones, F. E., **Weathering tests on asbestos-cement roofing materials.** *Great Britain. D partment of Scientific and Industrial Research, Building Research Technical Paper*, No. 29, 194 38 p. 7 figs., 15 tables, 5 refs. **GB-MO**—The effects of wetting and drying with heating and cooling frost action, exposure to acid rain water and atmospheric carbonation are examined. Natural an laboratory weathering tests were made and results tabulated for flat slates and sheets and for co rugated sheets. *Subject Headings:* **1. Weathering of materials 2. Building materials.**

1948

5J–57 551.5:620.19:629.1

Beaulieu, L. A., **The weathering of moulded plywood components. An account of tests carrie out to determine the effect of the Canadian climate on plastic-bonded plywood parts of an Av Anson airframe and other items.** *Aircraft Engineering*, London, 20:171–175, 186, June 194 26 figs. **DLC**—The exposed articles were mostly composed of laminated birch and laminated Sitk spruce. Various adhesives were used for bonding, with phenol-formaldehyde and polyvinyl-buter the most common. Periodic inspections were made and results are outlined. Good dimension stability was observed. Synthetic adhesives were generally satisfactory. The stresses due variable moisture content were seen to have a direct bearing on the life of the laminate. End-gra protection was important as a hindrance to moisture penetration. *Subject Headings:* **1. Weatheri of materials 2. Aeronautical engineering.**

5J–58 620.19:621.

Champion, A. H., **Climatic test chambers for testing telecommunication equipment, componen and materials to extremes of temperature and humidity.** *Australia. Council for Scientific a Industrial Research. National Standards Laboratory. Division of Electrotechnology, ETP* 7, 2 Draft/AHR, Jan. **1948.** 29 p. 7 figs., 23 plates, 4 tables. **GB-MO**—Four sections deal respective with the static, cycling, high temperature and low temperature chambers. Two appendices de with (a) the measurement and recording of temperature and humidity and (b) construction techniques for humidity chambers. The procedures have been developed to test in the laborato the suitability of equipment for service under severe climatic conditions. Close control of te perature and humidity ensures that test results are reproducible. *Subject Headings:* **1. Weatheri of materials 2. Telecommunications.**

5J–59 551.521.1:620.19:6

Crabtree, J., **Rubber and the weather.** *Bell Laboratories Record*, New York, 26(3):119–1 March **1948.** 7 figs. **DLC**—The author briefly discusses the structure of the rubber molecule a the break-down of the structure due to oxidation. The important agencies causing oxidation a the blue-green, violet and ultraviolet components of solar radiation, ozone, oxygen and wat Extended investigations enabled the separate roles of oxygen, sunlight and ozone to be clarifi A laboratory method of duplicating the effects of exposure to varying conditions is described. *Su ject Headings:* **1. Weathering of materials 2. Rubber.**

5J–60 551.524.37

Loe, J. A. and Sparkes, F. N., **The deterioration of concrete : some factors affecting the resistan of concrete to frost action.** *International Association for Bridge and Structural Engineering, Troisiè Congrès, Liege, Sept. 13–18*, **1948,** *Publication Préliminaire*, p. 201–214. 8 figs., table. Fren German and English summaries p. 212–214. **CtY**—Tests were carried out on 4 in. concrete cub

subjected to daily cycles of freezing in air at −20°C and thawing in water at 14°C, to determine the frost resistance. The water-cement ratio, cement content, aggregate grading and use of admixtures were varied. Results are given by a durability factor. Recommendations are given for the requirements of a frost-resisting concrete. *Subject Headings:* **1. Frost damage 2. Building materials.**

5J–61 551.510.53:620.19

Teed, P. L., **Properties of metals at stratospheric heights.** The English text of a paper given before l'Association Française des Ingénieurs et Techniciens de l'Aéronautique . . . at l'Ecole Nationale Supérieure de l'Aéronautique on Oct. 9, 1947. *Aircraft Engineering*, London, 20:207–214, July **1948.** 21 figs., 24 refs. **DLC**—The physical and chemical properties of the stratosphere are outlined. Corrosion under such chemical conditions is discussed. The author then considers in detail the effect of stratospheric temperatures on metallic materials used in aircraft construction. *Subject Headings:* **1. Structure of the stratosphere 2. Corrosion.**

1949

5J–62 551.525.5:62

Canada. Army Headquarters, Directorate of Engineer Development, **Permafrost. A digest of current information.** Ottawa, **1949.** 48+p. 32 figs., 12 refs. Mimeo. **GB-MO**—The work is designed to assist engineers in obtaining an understanding of the problems met in permafrost conditions. Problems of foundations, roads, bridges, airports and water-supply are separately considered. *Subject Headings:* **1. Permafrost 2. Civil engineering.**

5J–63 620.19

Dummer, G. W. A., **The corrosion of metals and metal finishes under humidity and salt spray tests—an analysis of four years tests at T.R.E.** *Great Britain. Telecommunications Research Establishment, T.R.E. Technical Note*, No. 50, Oct. **1949.** 43+8 p. [22 figs.]. **GB-MO**—The results of tests made on aluminium, aluminium alloys, brass, magnesium and magnesium alloys, stainless steel and on finishes on these are collected and summarized. The details of each test are given together with a summary of the results. An appendix describes equipment designed to photograph every hour the deterioration during exposure of the finishes on test to high temperature and humidity conditions. *Subject Heading:* **1. Corrosion.**

5J–64 551.581:620.19

Great Britain. Department of Scientific and Industrial Research, **Tropic proofing. Protection against deterioration due to tropical climates.** London, **1949.** 32 p. **GB-MO**—The pamphlet gives the results of extensive researches made during World War II on the methods of protecting materials and equipment from deterioration during storage and use in tropical climates. The effects on plastics, rubber, leather, wood, textiles, paper, etc. are given, together with results of various proofing tests. Optical instruments and electrical equipment are considered separately. *Subject Heading:* **1. Weathering of materials.**

5J–65 551.571:621.315.61

Meister, R., **Luftfeuchtigkeit und Isoliervermögen organischer Isolierstoffe der Hochspannungstechnik.** [Atmospheric humidity and insulating properties of organic insulants for high tension work.] *Elektrotechnische Zeitschrift*, 70(12):360–364, Sept. 15, **1949.** 6 figs., 3 tables, 8 refs., 5 eqs. **DLC**—The relation of life of organic insulants at room temperatures to the relative humidity of the air was investigated for various insulants. Weight increments after different periods were measured. Resistance of insulants both without and with lacquer, and aging coefficients are tabulated. *Subject Headings:* **1. Humidity effects 2. Insulating materials.**

5J–66 551.581:620.19

Nizery, A. and Crespi, S., **Un laboratoire pour étude de la résistance des matériaux en climat tropical.** [A laboratory for the study of the resistance of certain materials to tropical climate.] *Revue Générale de l'Électricité*, Paris, 58:455–468, Nov. **1949.** 15 figs. **DLC**—The author discusses the broad problem of deterioration due to climate and to microorganisms. He then studies actual climates and climograms are drawn for several tropical stations. The laboratory at Saint-Cyr-l'Ecole, which permits the reproduction of these climatic conditions is described in detail. *Subject Heading:* **1. Weathering of materials.**

5J–67 620.19

Vernon, W. H. J., **The corrosion of metals. Lecture 1: General principles. Lecture 2: Preventive measures.** *Royal Society of Arts, Journal*, 97(4798):578–610, July **1949.** 12 figs., 2 tables, 41 refs. **GB-MO**—The first of these two Cantor lectures discusses the electrochemical characteristics explaining the limitations of the standard electrode potential concept, immersed corrosion, promoting and controlling factors, accelerated tests, atmospheric corrosion, surface films,

anaerobic corrosion and underground corrosion. The second lecture is divided into four sections dealing with protective methods possible by modification of design, environment and the metal and finally by protective coatings. *Subject Heading:* **1. Corrosion.**

1950

5J–68 551.5:551.311.2:6

Garston, England. Building Research Station, **The weathering, preservation and maintenance of natural stone masonry. Pt. I.** Its *Building Research Station Digest*, No. 20, July **1950.** 7 p. 5 figs. **Pt. II.** *Ibid.*, No. 21, Aug., **1950.** 7 p. **DLC**—The author considers the agencies influencing the weathering of various building stones which are divided into limestone, sandstone and igneous types, and discusses aspects of maintenance and restoration of stone buildings. *Subject Headings:* **1. Weathering of materials 2. Building materials.**

5J–69 620.19:629.1

Long, J. K. and Ramke, W. G., **Rain erosion of aircraft plastics.** *U. S. Air Force. Air Materiel Command, AF Technical Report*, No. 5948, July **1950.** 49 p. 21 figs., 7 tables, 17 refs. **DLC**—Summarized rain erosion studies made at the Air Materiel Command, Cornell Aeronautical Laboratories, U. S. NACA, and other corporations. The rate of erosion was found to be greatly affected by speed of flight, angle of incidence and rain concentration. It was little affected by water temperature. No plastic laminate was found to resist rain erosion, but a new neoprene surfacing material gave good protection. *Subject Headings:* **1. Corrosion 2. Aeronautical engineering.**

5J–70 551.510.42:6

†McCabe, Louis C., **Atmospheric pollution.** *Industrial and Engineering Chemistry*, 42(7–10) 73A–74A, 85A–86A, 123A–124A, 77A–78A, July–Oct. **1950.** 3 figs., photos, 24 refs. **DLC**—In the July issue the summaries and recommendations of three of seven panels of the U. S. Technical Conference on Air Pollution (Wash., D. C., May 3–5, 1950) are given: Panels on Instrumentation on Equipment and on Analytical Methods and Properties. In the Aug. issue the reports of the other four Panels are given. In the Sept. issue there is a brief account of the history of the work on distribution of atmospheric contaminants since 1918. A bibliography is appended. The Oct. issue gives a description of the impinger method of stack sampling for dust analysis and of an adaptation of this method for collecting all mists and fumes, and of automatic and static pressure stack samples. Diagrams of the apparatus are given. (*Same item as* 2.8–44, Aug. 1951, *MAB.*) *Subject Headings:* **1. Atmospheric pollution 2. Air Pollution Conference, 1950 3. Smoke abatement 4. Industrial meteorology 5. Stack effluents 6. Air sampling and analysis.**—*I.L.D.*

5J–71 551.5:6

Reichel, E., **Schädenverhütung und Klimastatistik.** [Damage avoidance and climatic statistics.] *Maschinenschaden*, Wiesbaden, 23:122–124, **1950.** table. **GB-MO**—Technical climatology in the German Weather Service (U. S. Zone) is concerned with tabulation of extreme weather conditions for insurance and construction design. Table gives for three regions: extremes and frequencies of temperature, low relative humidity, heavy rain (day, 15 and 60 min.), snow cover, wind speed, barometric pressure, dense fog and ground frost. Effects of these and other elements or combinations of elements (e.g., on corrosion) are mentioned briefly. *Subject Headings:* **1. Industrial meteorology 2. Engineering.**

5J–72 551.5:620.

Walder, V. T.; Clarke, W. J.; DeCoste, J. B. and Howard, J. B., **Weathering studies on polyethylene.** *Industrial and Engineering Chemistry*, 42(11):2320–2325, Nov. **1950.** 11 figs., 2 tables, 13 refs. **MH-BH**—The effect of weather on polyethylene wire and cable applications is studied by means of an accelerated test, which is described and illustrated. It shows good correlation with natural ageing. Age resistance of polyethylene increases as average molecular weight of polymer is increased. The addition of channel carbon black, with a particle diameter of 25 mμ when well dispersed in a suitable polyethylene at concentrations of 1 to 2%, can produce a compound having resistance to outdoor weathering adequate for most normal conditions. (*Same item as* 2.3–March 1951, *MAB.*) *Subject Headings:* **1. Industrial meteorology 2. Corrosion.**—*I.L.D.*

1951

5J–73 551.521.11:6

Sippel, A., **Textilien und Sonnenlicht.** [Textiles and sunlight.] *Umschau*, Frankfurt, a.M. 51(18):554–556, Sept. **1951.** 3 figs., 4 refs. **DLC**—The destructive chemical effect of natural and artificial radiation and humidity on textiles is discussed and data on the decline in resistance of various fabrics after a half-year's exposure to weather influences presented. Methods for increasing the weather resistance of textiles, such as eliminating vulnerable components and conditioning with

ertain chemical treatments, are mentioned in general terms. A photograph of an instrument for xperimental sun exposure of textiles is included. (*Same item as* 3.6–94, June 1952, *MAB.*) *Subject leadings:* **1. Weathering of materials 2. Sunshine.**—*G.T.*

5J–74 620.19

Van der Woude, C. A. A., **Experience in regard to corrosion in tropical regions.** *Madjalah lmu Alam Untuk Indonesia, (Indonesian Journal for Natural Science)*, Bandoeng, 107(1/3):1–16 an./June **1951.** 13 figs. **MH-BH**—After a survey of simple electro-chemical reactions, and some auses of complications, the author reviews his experiences with the corrosion of lead. These ncluded lead used in sheets for roof construction, lead-lined cables, recrystallisation and fatigue racking. Argues that specific tropical corrosion phenomena for metals do not exist, but that due o the coincidence of optimal climatological circumstances, some processes may be accelerated. *ubject Headings:* **1. Tropical climatology 2. Corrosion.**

1952

5J–75 551.571:620.19

British Iron and Steel Research Association, **The fight against rust. The work of the Corrosion ommittee of the British Iron and Steel Research Association.** London, **1952.** 25 p. 14 figs., tables. **DLC**—Annual cost of rusting of steel estimated as £2,000,000 in U. S. and £200,000 in ritain. Case histories are given of corrosion in air, water and soil. Protective measures, methods f testing and other research are described. *Subject Heading:* **1. Corrosion.**

5J–76 551.577.1:69

Knetsch, Georg, **Geologie am Kölner Dom. Eine Studie über klimagesteuerte und dazu onvergente Bauschäden.** [Geology of Cologne Cathedral. A study of climatic and similar amage to a building.] *Geologische Rundschau*, 40(1):57–73, **1952.** 10 figs., refs. **DLC**—A study f the weathering of different parts of Cologne Cathedral, which was built of different types of stone rom 1248 onwards. The weathering is mainly due to chemical reaction, rain and wind or dripping ater; frost damage is unimportant, but the whole complex of factors depends on position in the uilding and is difficult to analyze. Photos of weathering given. (*Same item as* 4.6–179, June 953, *MAB.*) *Subject Headings:* **1. Weathering of materials 2. Cologne, Germany.**

1953

5J–77 551.510.42:551.581:620.19

Hudson, J. C. and Stanners, J. F., **The effect of climate and atmospheric pollution on corrosion.** *ournal of Applied Chemistry*, London, 3:86–96, **1953.** 13 tables, 4 figs., 3 refs. **DLC**—The Corosion Committee of the British Iron and Steel Research Association has for several years exposed pecimens of ferrous material (ingot iron and later copper-steel) and non-ferrous (zinc), at its corosion stations at home and overseas. The results are analyzed. In Great Britain the sulphur ontent of the air was found to be the principal factor determining the severity. At overseas sites, n the absence of sulphur pollution, corrosion was generally slight. A notable exception was on urf beaches in the tropics. Here the rates of corrosion were five times greater than at the worst laces in Great Britain. Tests on variation with height above the ground suggest that this is econdary to the natural variations from one year to another. *Subject Headings:* **1. Atmospheric ollution 2. Corrosion.**

5J–78 620.19

Port Harcourt, Nigeria. Tropical Testing Establishment, **Report on the atmospheric corrosion f metals at various sites in Nigeria. (Comprehensive report on trials from 1948 to 1952.)** London, [1953]. 60 p.+2 plates. Mimeo. **GB-MO**—Results are presented of the corrosion of mild steel, nd to a lesser extent of brass, aluminium, iron and zinc under a variety of tropical conditions. ariants which came to light during the trial included protection from rain and the seasonal effects overned by variations of the interrelated but imperfectly correlated factors of temperature, humidty, rain, solar radiation, wind speed and direction, and dew deposition. Protection from rain over period of up to three months does not reduce corrosion appreciably and may increase it. The aily deposition of dew appeared to have a considerable effect. *Subject Heading:* **1. Corrosion.**

C. TRANSPORT BY ROAD, RAIL, SEA AND AIR

1941

5J–79 551.571:629.12

Colvin, O. D.; Hahne, W. H. E. and Colby, M. R., **Care of cargo at sea—I. An investigation of "sweat" and other air-borne cargo damage.** *Society of Naval Architects and Marine Engineers,*

New York, Transactions, 46:1–44, 1938. 16 figs., 94 refs. **DN. II. Interim report on dehumidifica tion in ships.** *Ibid.*, 49:208–231, 1941. 24 figs. Discussion p. 231–238. **DN**—Investigatio shows that nearly all damage is traceable to moisture in the cargo hold coming either from the outsi air or from the hygroscopic nature of the cargo, or of materials in the hold. This leads to need f humidity control and ventilation. The authors advocate a duct system in the hold to recircula the air to which is connected a supply of air of low moisture content. The second report gives t results of the dehumidification system suggested in Pt. I, when the system was installed in tran oceanic freighters. The installations in different types of ships and portable dehumidifying uni are described. Experience stressed the danger from free moisture in the cargo. *Subject Heading* **1. Humidity effects 2. Cargo ventilation 3. Marine engineering.**

1942

5J–80 625.7:551.31

Zubov, Nikolai Nikolaevich, **Osnovy ustroĭstva dorog na ledianom pokrove.** [The constructi of roads on an ice cover.] Moscow, Gidrometeorologicheskaia Sluzhba Krasnoĭ Armii, **1942.** 74 26 figs., 16 tables. **GB-MO**—The monograph deals first with the physics of ice—temperature freezing and maximum water density, initial ice forms, salt content of sea ice, temperature a density of ice, rate of formation, melting and destruction, elastic properties, hardness and flow of i tensions and stresses, forces on ice subjected to a load, buoyancy, breaking and bending of ice und concentrated and distributed loads, bending of ice on narrow rivers and under a moving load. continues with studies of cracking of ice by temperature changes, by tides and by water movemer due to wind. The next sections describe artificial thickening of ice, wood and pile construction connecting roads on ice with the shore, use of fixed shore ice, ice crossings, airfields on ice, "fatigu of ice and calculation of permissible loads, for which the author develops an empirical formula a tables. Finally, the author describes methods of crossing ice not sufficiently strong and summari his conclusions. *Subject Heading:* **1. Roads on ice.**

1944

5J–81 551.58:62

Winterkorn, Hans F., **Climate and highways.** *American Geophysical Union, Transactio* 25(3):405–411, **1944.** fig., 8 refs. **DWB**—A general formulation of the problem of durability highway structures exposed to fluctuations of temperature and moisture. The mechanism of wa attack is illustrated by soil stabilized by Portland cement and exposed to alternate wetting and d ing. The condition of water in porous systems is illustrated by a phase diagram of its behavio terms of temperature and pressure, which explains some of the peculiar results of frost. Even apparently dry conditions, some roads act like "aerial wells" in collecting moisture under vary temperatures. *Subject Headings:* **1. Applied climatology 2. Highways.**

1947

5J–82 551.571:629

Colvin, O. D. and Duly, S. J., **Prevention of moisture damage to cargoes in general cargo spac** *North-East Coast Institution of Engineers and Shipbuilders, Newcastle upon Tyne, Transactio* 63:219–236, **1947.** 17 figs. Discussion D.135–D.164. **DLC**—Control of the dew point of the in the ship's hold should eliminate all damage from air-borne moisture. The evolution of met of such control is traced. Ship installations are described. *Subject Headings:* **1. Humidity effe 2. Marine engineering.**

5J–83 551.578.46:62

†Lawrance, N. G., **Drift control by snow fences. A digest of published information on engine ing practice and research in various countries.** *Surveyor and Municipal County Engineer*, Lond 106:643–645, Dec. 12, **1947.** fig., 22 refs. **GB-MO**—A useful survey of the scattered literature snow control. Types of snow fences in Sweden and Germany are illustrated, points most liabl snow drifts listed and arrangements of fences discussed. Some advice on placing snow fences give maximum protection, with descriptions of experiments in the Rock Island wind tunnel, is gi in an anonymous article in *Railway Engineering and Maintenance*, Chicago, 46:1132–1135, Dec. 19 *Subject Heading:* **1. Snow fences.**

5J–84 551.5:6

Radzikowski, H. A., **Apply climatic data? Naturally!** *Better Roads*, Chicago, 17(7):33–34, **1947.** fig. **GB-MO**—In reply to a criticism by H. Landsberg, author summarizes wide use m of weather forecasts, snow and ice warnings, and preventive construction methods against snow frost heaving. Many studies have been made of effects of microclimatic differences. The ques

of protection from floods is regarded as a matter of balancing cost against probability. Precautions against gale damage are referred to and some other climatic factors briefly mentioned. *Subject Headings:* **1. Applied meteorology 2. Highways.**

5J–85 551.579.4:625.7

Rowe, R. Robinson, **Hydrologic data for highway design.** *American Geophysical Union, Transactions*, 28(5):739–741, Oct. **1947.** table, 2 refs. **DWB**—Highways are preferably designed to be secure during floods of a certain frequency (once in 5–100 years) depending on the purposes of the highway. Bridges are usually designed for a 30-year peak discharge. Existing data are inadequate and suggestions are made for publishing momentary peak stream flows and data of excessive precipitation. One suggestion is the establishment of trap gages, operating only in heavy rain, in regions subject to cloudbursts. *Subject Headings:* **1. Flood frequencies 2. Highways.**

1949

5J–86 551.556:624.82

Allaart, P. J., **Ein ondersoek naar de winddruk op beweegbare bruggen met horizontale draaiingsas.** [An investigation of wind pressure on movable bridges with a horizontal axis.] *Ingenieur*, The Hague, 61(8):B11–B16, Feb. 25, **1949.** 16 figs., table. **GB-MO**—A detailed analysis with curve drawings of the effect of strong winds on a model drawbridge. *Subject Headings:* **1. Wind pressure 2. Bridge construction.**

5J–87 551.578.4:625.76(788)

Stewart, D. N., **Snow problems on Colorado highways.** *Western Snow Conference, 17th Annual Meeting, April* **1949**, *Proceedings*, p. 14–22. **DWB**—Problems arising in the winter maintenance of 4000 mi. of highways lying between 3400 ft and 12,000 ft elevation (Loveland Pass). Sixteen mountain passes lie above 9000 ft. Snowfall averages from 15 in. to 389 in. a year (7-year record), with a maximum winter fall of 808 in. at Wolf Creek Pass in 1936–1937. Since 1928–1929, one or more passes have been kept open all winter. Snowslides usually occur in Feb. and March. (*Same item as* 3.8–155, Aug. 1952, *MAB.*) *Subject Headings:* **1. Snow removal 2. Snowfall 3. Avalanches 4. Colorado.**—*M.R.*

1950

5J–88 551.586:628.8:656.6

Bullen, Francis Lisle, **The ventilation and heating of ships.** [3d ed.] Liverpool, Birchall & Sons [1950]. 175 p. illus.—Review by C. E. N. Frankcom in *Marine Observer*, 21(151): 32–34, Jan. **1951. DWB**—Deals with: properties of air, ventilation requirements, methods of ventilation, air conditioning, etc. The meteorological aspect of ventilation and the effect of various conditions of humidity and temperature on the human body and cargo are dealt with clearly, including the complications caused by different humidity requirements of different commodities. (*Same item as* 2.8–157, Aug. 1951, *MAB.*) *Subject Headings:* **1. Heating and ventilating 2. Marine engineering. I. Frankcom, C. E. N.**—*C.E.P.B.*

5J–89 551.578.7:656.7

Kangas, Pell, **Hailstone impact tests on aircraft structural components.** *U. S. Civil Aeronautics Administration, Technical Development Report*, No. 124, **1950.** 20 p. 15 figs., 4 tables, footnote refs. **DLC**—Account of tests with ice spheres 0.75 to 1.88 in. diameter projected at speeds of 100 to 804 mph at various angles against sections of plastic, glass and metal. Some statistics of hail frequency are included. *Subject Headings:* **1. Hail damage 2. Aircraft damage.**

5J–90 551.5:625.1

Kasamura, Y., **Fires along the railroad and weather in Ōita. (1st Report.)** *Journal of Meteorological Research, Tokyo*, 2(8):244–249, July **1950.** fig., 2 tables, 8 refs. In Japanese, English summary p. (5–6). **DWB**—Most fires along the railroad originate from cinders, frequently around March in the mountain area. Usual pressure type: in winter high to the west, in spring travelling high. Humidity is low (below 60–40%) and wind strong (above 7.8 m/sec). (*Same item as* 2.4–5, April 1951, *MAB.*) *Subject Headings:* **1. Fire weather 2. Railways 3. Ōita 4. Japan.**—*C.E.P.B.*

5J–91 551.578.46:625.16

Pugh, H. Ll. D., **Snow fences.** *Harmondsworth, England. Road Research Laboratory, Road Research Technical Paper*, No. 19, **1950.** 52 p. 66 figs., 2 plates, 8 tables, 25 refs., eqs. **DLC**—Types of snow fence are described and illustrated, and their method of action described. In Pt. 3 the systematic arrangement of fences to suit different conditions is set out with numerous diagrams. In Pt. 4 experimental work on model tests in a wind tunnel is described with diagrams of eddies behind 4 ft fences 50% slatted (horizontal and vertical slats) and solid. Length of eddy area and

position of maximum depth of drift are related to height of fence for different fence densities an heights, snow densities and wind speeds. Full summaries are given of the model and full scale test by NØKKENTVED in Denmark, HALLBERG's studies of wind streams and velocities in Sweden, an research in Germany. A number of conclusions are drawn. An appendix discusses the mechanic of snow drifting. *Subject Heading:* **1. Snow fences.**

1951

5J–92 551.524.37:631.4:625.

Anderson, Anton A., **Construction and maintenance problems encountered on the Alask Railroad.** *Alaskan Science Conference, 2nd, Mt. McKinley National Park, Sept. 4–8,* **1951,** *Pr ceedings,* p. 136–149. **DWB**—Among the problems which have confronted the construction an maintenance crews along the 470 mi. of railroad from Seward–Anchorage–Fairbanks, Alaska, sinc it was first built in 1917, are drainage, frost heaving and extreme cold (down to −72°F). Measure taken to combat the conditions are discussed. *Subject Headings:* **1. Arctic construction 2. Fro heaving 3. Railways 4. Alaska.**—*M.R.*

5J–93 551.58:625

Henley, E. D., **Weather and the carriage of freight by rail in Britain.** *Weather,* London, 6(8 233–236, Aug. **1951.** 2 photos. **MH-BH**—Problem of protection of freight during summer an winter conditions is considered. The temperature and time factors are all-important. In summ chemical and bacterial actions responsible for deterioration in perishable goods quicken with increa ing temperature. Ventilation and insulation methods of prevention are described. The wint difficulties due to condensation and prolonged frost are outlined. *Subject Headings:* **1. Weath effects 2. Railways.**

5J–94 551.574.42:625

Ice formation on conductor rails. *Meteorological Magazine,* London, 80(943):24–25, Jan. **195** 2 photos. **DWB**—Describes an investigation in progress to show relation of temperature of rails temperature and humidity in screen which will help in forecasting icing. (*Same item as* 2.6–9 June 1951, *MAB.*) *Subject Headings:* **1. Icing forecasts 2. Transportation facilities.**

5J–95 551.574

Lewis, William (*U. S. Weather Bureau, Wash., D. C.*), **Meteorological aspects of aircraft icin** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 1197–120 4 tables, 19 refs., 3 eqs.) **MH-BH**—The physical characteristics of icing conditions as determin by the parameters of liquid water concentration, drop diameter and temperature; the importan of temperature and drop size in determining the severity of icing for the various components of aircraft as a result of the variation of the kinetic temperature rise with air speed and the dependen of collecting efficiency upon drop size, air speed and shape of the object; the definition of icing i tensity on the basis of the U. S. Weather Bureau scale; and the methods of measuring liquid wat concentration and drop size diameter are discussed. The physical processes determining the co centration of liquid water in clouds and the consequent formation of clouds by convection (cumul and cumulonimbus); by turbulence (stratus and stratocumulus) and by horizontal convergen (altostratus, altocumulus and altocumulus-altostratus); the meteorological conditions responsi for freezing rain and freezing drizzle and statistical data on liquid water concentration and dr size in various types of clouds are summarized. The icing conditions likely to be found in vario types of clouds and the problems of forecasting icing conditions in clouds of known type, dimensio and temperature and of flight planning and dispatching in relation to icing conditions are outlin Problems for further research are recommended and the possible use of ice seeding to reduce ici hazard near airports, single automatic apparatus for determining liquid water concentration a mean drop size conditions under which the crystals are formed and distribution of drop size in clou discussed. (*Same item as* 3.11–5, Nov. 1952, *MAB.*) *Subject Headings:* **1. Icing of aircraft 2. Ici prevention 3. Liquid water content of clouds 4. Drop size distribution.**—*I.L.D.*

5J–96 551.57

Pittsburgh melts record snowfall. Snow-melting systems keep up with 31-inch Decemb storm. *Heating and Ventilating,* 48(2):83, Feb. **1951.** illus. **DLC**—Effect of snow-melting h water pipes installed under some sidewalks in Pittsburgh are shown on 4 annotated photos. ma during Dec. 1950 storm. *Subject Headings:* **1. Snow melting techniques 2. Sidewalks.**—*G.T.*

5J–97 551.509.9:625.1:61

Sakamoto, F. and Kumano, M., **Railway accidents owing to some weather factors on San Line.** *Journal of Meteorological Research,* Tokyo, 3(6):187–193, March **1951.** 3 figs., 15 tabl In Japanese, English summary p. (13). **DWB**—The frequency of railway accidents rises when t

snow depth exceeds 20 cm and the wind velocity is greater than 7 m/secs and when typhoons produce rainfall greater than 70 mm/day or 450 mm over a few days. Fires along railroad lines occur seldom when the minimum relative humidity is greater than 70% and the wind velocity is less than 6 m/sec. (*Same item as* 3.9–79, Sept. 1952, *MAB.*) *Subject Headings:* **1. Weather effects 2. Railway accidents 3. Japan.**—*From author's abstract.*

1952

5J–98 551.584.61:656.4

Dirmhirn, Inge, **Über das Klima in den Wiener Strassenbahnwagen.** [On the climate in Vienna street cars.] *Wetter und Leben*, 4(9–10):158–162, Dec. **1952.** **MH-BH**—Observations of temperature and cooling power in Feb. and Aug. 1952 in different types of street car and trailer are described. Excess of inside over free air temperature ranged from 5.4 to 10.3°C in winter and 1.6 to 2.6°C in summer, according to type of car, especially ventilation; it increased with number of passengers. There was often a strong temperature inversion inside the vehicle. The cooling power in winter varied from 9.1 to 10.1 m cal/cm²/sec inside and 14 to 16.2 on platform, compared with 25.7 in outside air. Cooling was greatest in cars with open platforms. In summer, cooling power depends on ventilation and radiation and varies greatly, but is generally small. The new American type with ventilators at head height gave greatest feeling of coolness. (*Same item as* 4.9–220, Sept. 1953, *MAB.*) *Subject Heading:* **1. Street car climates.**—*I.L.D.*

5J–99 551.556:624.5

†Fraser, R. A. and Scruton, C., **A summarised account of the Severn Bridge aerodynamic investigation.** *Teddington, England. National Physical Laboratory, Report*, No. N.P.L./AERO/222, Feb. **1952.** 69+p. 44 figs., 20 tables, 35 refs., eqs. Mimeo. **GB-MO**—Researches into aerodynamic stability of bridges in winds, mainly on models in wind tunnels, are described in this richly illustrated report. They included a 1/32 model of the proposed Severn Bridge. New methods of calculation of elastic stiffness and natural frequencies were developed. (*Same item as* 4.4–169, April 1953, *MAB.*) *Subject Headings:* **1. Wind pressure 2. Bridge construction.**

5J–100 551.586:551.515:656.08 551.586:551.594.9:656.08

Reiter, Reinhold (*Munich*), **Verkehrsunfallziffer und Reaktionszeit unter dem Einfluss verschiedener meteorologischer, kosmischer und luftelektrischer Faktoren.** [Traffic accident statistics and reaction time under the influence of different meteorological, cosmic and atmospheric-electric factors.] *Meteorologische Rundschau*, 5(1–2):14–17, Jan.–Feb. **1952.** 8 figs., 10 refs. **MH-BH**—Statistics of 21,000 traffic accidents and 45,000 reaction times of men, in Bavaria, were compared by *n*-method with weather conditions. Besides a weekly rhythm, results showed positive correlation of accidents with fog, heavy rain or snow, and of both accidents and reaction times with magnetic and electric (infra-long wave) disturbances. The last are regarded as an important bioclimatic indicator. No relations were found with sunshine, föhn or cosmic factors. (*Same item as* 3.9–216, Sept. 1952, *MAB.*) *Subject Headings:* **1. Bioclimatology 2. Traffic accidents 3. *n*-method.**—*C.E.P.B.*

5J–101 551.578.7:629.135:016

†Souter, Robert K. and Emerson, Joseph B., **Summary of available hail literature and the effect of hail on aircraft in flight.** *U. S. NACA, Technical Note*, 2734, Sept. **1952.** 162 p. 30 figs., 6 tables, bibliog. p. 93–162. **DWB**—Available information on the hail phenomenon affecting aircraft in flight has been examined. This paper attempts to coordinate the present knowledge of hail with the effect of hail on aircraft in flight and includes (1) a digest of the literature on the physical properties, the occurrence, and the formation of hail; (2) a survey of the hail effect on aircraft in flight from analyses of 57 cases of airplanes damaged by hail; (3) a résumé of hail information for the benefit of pilots, forecasters and ground operational personnel; and (4) a hail bibliography of 552 articles for use of research personnel. The bibliography is arranged according to seven general classes and chronologically within each class. Many items are annotated. (*Same item as* 4.1–12, Jan. 1953, *MAB.*) *Subject Headings:* **1. Hail bibliographies 2. Hail formation 3. Hail damage 4. Aircraft damage. I. U. S. NACA.**—*From authors' abstract.*

5J–102 551.556.1:533.607

Teddington, England. National Physical Laboratory, **The industrial application of aerodynamic techniques.** Its *Notes on Applied Science*, No. 2, **1952.** 37 p. 16 figs., 8 refs. **GB-MO**—The pamphlet discusses the basic principles of problems involving moving air, including air streamlines, air pressure on constructions, oscillations due to wind, ventilation, etc. generally associated with flow past nonstreamlined bodies. The approach is through pressure and suction effects on models in wind tunnels, due to eddies. Special problems dealt with are the aerodynamic stability

of suspension bridges, wind resistance to cars and trains, spread of smoke from chimney stack and ships' funnels, ventilation, storage and drying processes, including use of Froude Number. Th paper ends with an account of wind tunnel techniques and instrumentation. *Subject Heading* **1. Wind effects 2. Wind tunnels.**

5J–103 551.556:62

Biggs, J. M., **Wind loads on truss bridges.** *American Society of Civil Engineers, Proceeding* 79, *Separate*, No. 201, July 1953. 19 p. 13 figs., 2 tables. **DWB**—The author presents the resul of wind tunnel tests on two scale models of a typical double track railroad bridge. Modificatio of one of the basic models were made to obtain data for highway bridges and various truss spacing Tests were conducted with wind speeds of 50, 60 and 70 m.p.h. Aerodynamic coefficients obtaine at these speeds were in agreement. *Subject Headings:* **1. Wind pressure 2. Bridge construction.**

5J–104 551.524.37:625.7:631

Erlenbach, L., **Frost und Tauschäden an Strassen und Massnahmen zu ihrer Verhütun** [Frost and thaw damage to roads and measures for prevention.] *Strasse und Verkehr*, Solothurn 39(10):359–363, Sept. 1953. 11 figs. **DLC**—The author briefly discusses the process of freezin A diagram illustrates the depth of freezing during a freeze and thaw period, Dec. 1946–April 194 The method of measuring is described, and the results with different soils analyzed to show su ceptibility of certain grades to frost. Protection of road joints in concrete surfaces is discusse *Subject Headings:* **1. Frost penetration 2. Highways.**

1954

5J–105 551.5:629.12

Brown, P. R., **Cargo ventilation.** *Marine Observer*, 24(164):97–102, April 1954. 3 figs. **M BH**—Analysis of problems of maintaining suitable temperatures in uninsulated cargo spaces in shi against solar radiation and heat transferred from engine room, surrounding air and water and brought in by ventilation. Rules are formulated for making use of dew point with dry and hygr scopic cargoes. Experiences on a new liner MV *Cedric* with forced ventilation are described, cluding diurnal variation of relative humidity. *Subject Heading:* **1. Cargo ventilation.**—*C.E.P.B.*

D. ELECTRICAL AND RADIO ENGINEERING

1910

5J–106 551.574.42:621.315(7

Fowle, Frank F., **A study of sleet loads and wind velocities.** *Electrical World*, New Yo 56(17):995–1000. Oct. 27, 1910. 6 figs., 12 tables, 15 eqs. **DLC**—Based on data obtained at Chicago, Ill., Weather Bureau Station between 1873 and 1910, the author has compiled tables a graphs to show probability of daily or monthly winds of certain speeds at different elevations. T 34 actual sleet storms which occurred at Chicago from 1900–1909 are tabulated in connection w maximum wind speeds and severity of ice. The worst occurrence was 2.5 in. of ice with a maxim wind of 53 mph. Highest speed of all was 60 mph (trace of sleet), and 86 mph (1 min.) after a hea glaze storm (Dec. 26, 1904) with falling temperature. Once 2 in. (diameter) of ice remained wires several days. Downward wind motion would add to wind load, but this occurrence is r (*Same item as* 3J–38, Oct. 1952, *M.A.B.*) *Subject Headings:* **1. Glaze storms 2. Glaze inten 3. Icing of transmission lines 4. Wind loads on wires 5. Chicago, Ill.**—*M.R.*

1936

5J–107 551.5:62

Hrudička, Bohuslav, **Meteorologie im Dienste der elektrotechnischen Praxis.** [Meteorol in the service of electrotechnic practice.] *Zeitschrift für angewandte Meteorologie*, 53(5):140– May 1936. refs., eqs. **DWB**—After a brief consideration of rainfall and wind as sources of p meteorological phenomena which affect power lines are set out. These are: temperature varia (changing conductivity), pressure (insulation), both relatively unimportant, fog, rain and espec solid precipitation (snow above 0°C, glaze, and, even worse, rime). Effect of shape and clim exposure of conductor is considered; rime formation increases as square of (time×wind spe Wind pressure is an important factor, depending on surface area, air density, square of speed, a function of Reynolds number, and also on period of oscillation of the system. Direct and ind effects of lightning are important and a warning system is discussed. *Subject Headings:* **1. Indus meteorology 2. Electrical engineering.**

1937

5J–108 551.5:621.3

Hrudička, Bohuslav, **Die meteorologischen Probleme in der Elektrotechnik.** [Meteorological problems in electrotechnics.] *Zeitschrift für angewandte Meteorologie*, 54(8):241–251, Aug. **1937.** refs. **DWB**—Formulas are set out and discussed for load on a conductor, conditions affecting reservoirs (ice cover, evaporation), energy of wind and wind-driven generators. Other points discussed are heating of cables by solar radiation, hindrance of construction works by low temperature and frost, vibrations of conductors due to wind, resistance of insulators and loss by "coronas," and lightning effects, including "radioactive" averters. In central Europe meteorological effects cause 10–15 interruptions a year of power supply per 100 km of exposed conductors (30–50% of all interruptions). *Subject Headings:* **1. Electrical engineering 2. Industrial meteorology.**

5J–109 551.594.221:621.315

Müller-Hillebrand, D., **Beitrag zur Frage der Existenz besonders blitzgefährdeter Stellen.** [Contribution to the question of the existence of places especially liable to lightning.] *Institutul Român de Energie [Publication]*, No. 138, **1937. DLC.** 12 p. 6 figs., 22 refs. Reprinted from its *Buletinul I.R.E.*, 5(3), **1937. DLC**—Disturbances of supply are not entirely governed by frequency of thunder at meteorological stations, e.g., in Germany. The variation of cases of damage from year to year is much greater than that of thunder and annual variation is different. The number of disturbances is about 0.4 times the number of thunder hours in May–Sept., and different average duration of storms in different months explains the anomaly. *Subject Heading:* **1. Lightning danger.**

1939

5J–110 551.509.54:621.311.2

Gilkeson, W. R., **The use of weather forecasts in electric power system operation.** *American Meteorological Society, Bulletin*, 20(8):338–340, Oct. **1939. DWB**—Summary of experiences of Tennessee Electric Power Co. with suggestions for economizing labor and minimizing effects of ice storms and providing storage for predicted flood water. *Subject Headings:* **1. Flood forecasting 2. Glaze forecasting 3. Power systems.**

5J–111 551.574.42:551.553(477)

Turoverov, K. S., **K voprosu analiza sushchestvuiushchikh sposobov vychisleniia gololednykh i vetrovykh nagruzok.** [On the problem of analyzing existing methods of computing glaze and wind loads.] *Meteorologiia i Gidrologiia*, No. 7–8:57–67, **1939.** 2 figs., 7 tables, 41 refs. **DLC**—Author considers the problem of glaze in relation to wind, using observations from the southeastern U.S.S.R., and concludes that heavy loads of glaze are usually accompanied by high wind speed. Some characteristics of the synoptic conditions accompanying such glaze formation are given. (*Same item as* 3J–53, Sept. 1950 and 3J–151, Oct. 1952, *MAB.*) *Subject Headings:* **1. Icing of transmission lines 2. Wind loads 3. U.S.S.R.**

1940

5J–112 551.594.221:621.316.933

Gross, I. W. and McMorris, W. A., **Lightning currents in arresters at stations.** *American Institute of Electrical Engineers, Transactions*, 59:417–422, Aug. **1940.** 10 figs., 6 tables, 4 refs. **DLC**—Measurements of 459 arrester discharge currents with surge-crest-ammeterlinks are analyzed in four regions in U. S., 1936–39. Of these 401 (87.6%) were negative. There is great seasonal and local variation. Of the associated traveling-wave voltages, 93% would have been dangerous to station equipment on 11–33 kv lines, 74% on 44–88 kv and 35% on 132 kv lines. *Subject Heading:* **1. Lightning protection.**

5J–113 551.574.4:621.3

Josse, H., **De l'influence des conditions atmosphériques sur les amorçages d'arcs sur les lignes à haute tension.** [The influence of atmospheric conditions on arcing on high-tension lines.] *La Météorologie*, July–Dec. **1940.** p. 147–151. 2 figs., 2 tables. **DWB**—Sixty breakdowns of high tension lines were analyzed for weather (mostly rain, fog or dew) and time of day (mostly just before sunrise or more than an hour after sunset). Moisture appears to be the important factor. A theory in which dust deposited on the insulators and the morning rise of temperature both play a part is illustrated by an actual case near Paris, in which a failure was immediately preceded by melting of hoar frost. *Subject Headings:* **1. Weather effects on electric power 2. France.**

1941

5J–114 551.594.22:621.3

British Electrical and Allied Industries Research Association, **Surge phenomena. Seven years' research for the Central Electricity Board (1933–1940).** London, **1941.** 426 p. 445 figs.

116 tables, refs. at end of most chapters. **DLC**—The work is divided into five principal parts The first is devoted to a study of lightning; its nature, methods of recording surge voltages and description of the research carried out in Nigeria. This section brings together the work of me teorologists, engineers and physicists. The second part deals with surge propagation on 33-k and 132-kV transmission lines. Pt. III is concerned with surge voltage distribution in transformer Pt. IV with the effects of surges on insulation, and considers solid dielectrics, cables and insulator The last part deals with protection against surges. It summarizes methods in common use; d scribes field tests on surge protective devices, the E.R.A. surge filter, and the National Physic Laboratory's report on this filter. *Subject Headings:* **1. Lightning 2. Lightning protection 3. Ele trical engineering.**

5J–115 551.58:621.3

Schulze, W. M. H., **Tropenklima und Fernmeldetechnik.** [Tropical climate and telecommun cation technique.] *Elektrische Nachrichten Technik*, Berlin, 18:134–147, **1941.** 29 figs., 4 tables, refs. **DLC**—A general summary is given of the meteorology of the belt 35°N–30°S, including d crease of temperature with height. Relative humidity is the most important element; frequen distribution, mechanical and chemical action are described, and effects on various types of insulate cables and condenser capacity are set out in detail. Dew is important in corrosion of metals. Ten perature inside light buildings may reach 70°C and on soil 80°C. This acts chiefly by acceleratin the effect of high humidity. In dry climates daily range of temperature is important. Wind important in moderating temperature. Solar radiation may reach 1.6 cal/cm²/min. Soil ten peratures are important for buried cables; insulation resistance decreases with increasing temperatur Effects on condensers are discussed. Other elements discussed are light, sandstorms, thunder a plant and animal pests. *Subject Headings:* **1. Climatic effects 2. Electrical engineering 3. Tel communications.**

1942

5J–116 551.574.42:621

Eredia, Filippo, **I depositi di ghiaccio sui conduttori delle linee aeree.** [Deposits of ice conductors of aerial lines.] *Annali dei Lavori Pubblici*, Rome, 80(1):1–14, Jan. **1942.** 13 fig refs. **DLC**—Various forms of ice encrustations are classified and illustrated. Their geographic distribution is described and their characteristics and mode of formation from supercooled drople in cloud set out. The condensation nuclei are mainly products of combustion. The meteorologic situations (warm front) and isobaric types favorable to their formation are set out. Finally, pr cautions are described. *Subject Heading:* **1. Icing of cables.**

1943

5J–117 551.594.22

McCann, G. D., **Lightning phenomena.** *Westinghouse Electric and Manufacturing Co., E Pittsburgh, Pa., R-1043* [**1943**]. 26 p. 33 figs., 3 tables, 29 refs. **DWB**—A description is giv of the recording instruments, including cameras used in the study, and of the recording stations various heights established for measuring direct stroke currents. Data obtained are correlated w those of other investigations. The charge distribution, the types of discharge, and the mechanis of strokes to ground and to tall objects are discussed on the basis of data recorded. Results are giv of the calculations made of electric and magnetic fields by strokes to earth. *Subject Heading* **1. Lightning 2. Lightning damage.**

1945

5J–118 551.5:62

Mahaffy, F. J., **Meteorology—aid to electrical engineers.** *Electrical Engineering*, New Yo 64:290–294, **1945.** ref. **DLC**—A brief description is given of present-day forecasting, its pow and limitations. This is then applied to planning outdoor operations near Quebec, effect of weath on electric equipment (glaze, lightning, humidity), forecasting consumer demand for power, a short-term management of water resources of hydroelectric power companies, including flood fo casting. *Subject Headings:* **1. Electrical engineering 2. Quebec, Canada.**

5J–119 551.594.221:62

Ruedy, Richard, **The distribution of thunderstorms and the frequency of lightning flash A review.** 2d ed. rev. & enl. *National Research Council of Canada, N.R.C.*, No. 1282, April 19 70 p. 18 figs., tables, refs. Mimeo. **DLC**—A general account is given of the cause and locati of thunderstorms, thunderstorm warnings from weather charts and atmospherics, causes of lo variations in frequency of lightning strikes in general and on transmission lines, including effect air conductivity and underground water. Average annual frequency of thunderstorms at statio in Canada is tabulated, and influence of relief investigated. Constitution of a flash is discuss *Subject Headings:* **1. Lightning 2. Electrical engineering.**

5J–120 551.5:621.3

Weather and electric power systems. Discussion at Joint Meeting of Institution of Electrical Engineers and Royal Meteorological Society. *Royal Meteorological Society, Quarterly Journal*, 71(309–310):283–317, July–Oct. **1945.** 11 figs., refs. **DWB**—1. FORREST, J. S., **The effects of weather on power-system operation,** p. 283–286, discussed load variations for heating and lighting, due to weather, and statistics and forecasts required by the power-system engineer. 2. GRIMMITT, H. W., **Ice, storms and overhead lines,** p. 286–289, with map, distribution of breakdowns due to ice-loading of conductors. 3. DRUMMOND, A. J., **Weather statistics,** p. 289–294, gave data of temperature, heavy rain and thunder at Kew. 4. POULTER, R. M., **Radio-sondes and thunderstorm forecasting,** p. 294–297 described use of tephigram. A general discussion followed including among others, contributions by DOUGLAS, C. K. M., on short-period forecasting; THWAITES, R. A. S., on effect of rime, ice and snow on overhead lines; GLASSPOOLE, J., on progress in statistical meteorology; POWELL, E. B., on load forecasting. *Subject Headings:* **1. Electrical engineering 2. Applied meteorology 3. Icing of cables.**

1947

5J–121 551.582:621.3(54)

Allan, R., **Electrical engineering problems in the tropics.** *Beama Journal*, London, 54:442–447, **1947. DLC**—Extensive adoption of electric power schemes in India is likely to lead to widespread instrumental troubles through use of unskilled labor and tropical weather conditions. Metal exposed to the sun may reach 75°C. This leads to loss of resistivity of insulators and burning out of motors, shrinkage of parts through drying out of oil, etc. High relative humidity at high temperatures causes absorption of moisture and loss of insulation. Asbestos and black adhesive tape are especially bad. Condensation on cooling causes flashovers, but may be eliminated by providing thorough ventilation and draining holes. Many other suggestions as to suitable materials, etc. (e.g., leather instead of rubber washers) are made. *Subject Headings:* **1. Electrical engineering 2. India.**

5J–122 551.594.221:621.315/6

Berger, K., **Lightning research in Switzerland.** *Weather*, 2(8):231–238, Aug. **1947.** 4 figs., 5 photos. **DWB**—Summary of research in Switzerland into voltage surges on transmission lines. The equipment installed on Monte San Salvatore near Lugano is described and illustrated. Quantities recorded were positive and negative charge of each surge, crest values of positive and negative surges 3000–100,000 amp, tails of discharges of long and short duration. Two cathode-ray-oscillographs were added in 1945 and 1946, to record discharge current in 1/50 and 1/5000 sec; typical records are shown and analyzed. Similar work on the Empire State Building is compared; the San Salvatore strokes more nearly resemble the usual lightning strokes to ground. *Subject Headings:* **1. Lightning 2. Electrical engineering 3. Switzerland.**

5J–123 551.594.221:621.315/6

Berger, K., **Neuere Resultate der Blitzforschung in der Schweiz.** [New results of lightning investigation in Switzerland.] *Schweizerischer Elektrotechnischer Verein, [Bulletin?]*, **1947.** 11 p. 19 figs., 24 refs. Abstracted from reprint. **GB-MO**—The effect of lightning flashes in overloading high tension conductors is discussed. Most of the charge flows direct to earth instead of along the line. Other researches on measurement of lightning current are summarized and an account is given of the installation on Monte San Salvatore near Lugano with specimens of the records. These are discussed. Plots show the frequency of different numbers (1–17) of strokes in positive and negative discharges, of the duration of the whole discharge (0.05–1.5 sec) and of individual strokes, electrical charge, etc. The source of discharges from positively and negatively charged clouds is discussed. *Subject Headings:* **1. Lightning 2. Electrical engineering 3. Switzerland.**

5J–124 551.5:621.396

Physical Society of London and Royal Meteorological Society, **Meteorological factors in radio-wave propagation; report of a Conference held on 8 April 1946 at The Royal Institution, London.** London [1947]. 325 p. figs., tables, refs. **GB-MO**—This report includes 21 papers describing various investigations concerned with the effect of the meteorological conditions of the lower atmosphere on the bending of very short radio waves transmitted through it. The list of contributions is as follows: APPLETON, SIR EDWARD, **The influence of tropospheric conditions on ultra-short wave propagation,** p. 1–17. SMITH-ROSE, R. L. and STICKLAND, A. C., **An experimental study of the effect of meteorological conditions upon the propagation of centimetric radio waves,** p. 18–37. SHEPPARD, P. A., **The structure and refractive index of the lower atmosphere,** p. 37–79. BOOKER, H. G. and WALKINSHAW, W., **The mode theory of tropospheric refraction and its relation to wave-guides and diffraction,** p. 80–127. HARTREE, D. R., MICHEL, J. G. L. and NICOLSON, PHYLLIS, **Practical methods for the solution of the equations of tropospheric refraction,** p. 127–168. RYDE, J. W., **The attenuation and radar echoes produced at centimeter wave-lengths by various meteorological phenomena,** p. 169–189. WESTWATER, F. L., **Radar storm detection I,** p. 190.

Ross, R. G., **Radar storm detection II,** p. 190–193. Durst, C. S., **Radio climatology,** p. 193–212. Johnson, Sir Nelson K., **Meteorological investigations in connection with radio propagation,** p. 212–215. Saxton, J. A., **The dielectric properties of water vapour at very high radio frequencies,** p. 215–238. Ramsay, J. A., **The vertical distribution of radar field strength over the sea under various conditions of atmospheric refraction,** p. 238–242. Alexander, F. E. S., **Observations on unorthodox radar vision in the vicinity of New Zealand and Norfolk Island,** p. 242–249. Macfarlane, G. G., **A method for deducing the refractive-index profile of a stratified atmosphere from radio observations,** p. 250–252. Stickland, A. C., **Refraction in the lower atmosphere and its application to the propagation of radio waves,** p. 253–267. Best, A. C., **A standard radio atmosphere for microwave propagation,** p. 267–273. Bull, G. A., **Note on errors in measurement of the refractive index of the air for high-frequency radio waves consequent upon errors in meteorological measurements,** p. 273–278. Saxton, J. A. and Lane, J. A., **The anomalous dispersion of water at very high radio frequencies.** Pts. I–IV, p. 278–325. *Subject Headings:* **1. Refraction of electromagnetic waves 2. Conferences.**

5J–125 551.524.3:621.315

Prache, P. M., **Influence des variations de température sur l'affaiblissement des circuits de télécommunications en câbles enterrés.** [Influence of variations of temperature on the weakening of telecommunication circuits in buried cables.] *Annales des Télécommunications,* Paris, 2:190–201, **1947.** 9 figs., 7 tables, 18 refs., 53 eqs. **DLC**—The paper aims at a method of calculating the weakening of buried cables with changes of air temperature, and hence at finding the minimum depth at which circuits can be used without automatic correction. *Subject Headings:* **1. Temperature effects 2. Telecommunications 3. Electrical engineering.**

1948

5J–126 551.594.221:621.315

†Berger, K., **Technical survey of modern lightning and overvoltage problems.** *International Conference of the Principal High Tension Electrical Systems, 12th, Paris,* **1948,** *Proceedings,* v. Paper No. 327. 14 p. 27 refs. On title page: Conférence Internationale des Grands Réseaux Électriques à Haute Tension. **DLC**—This short summary of the state of knowledge of lightning research, surge protection and surge arrester technique refers to numerous papers (1939–1947) listed in the bibliography, and discusses questions which still required working out. *Subject Headings:* **1. Lightning 2. Electrical engineering.**

5J–127 551.5:621.3

Booker, H. G., **Some problems in radio meteorology.** *Royal Meteorological Society, Quarterly Journal,* 74(321–322):277–307, July–Oct. **1948.** 19 figs., 35 eqs. **DWB**—A study of the effect of vertical gradients of temperature and humidity in the lower troposphere on the transmission of short-wave radio and radar. The occurrence of superrefraction is described and the explanation given in terms of a radio duct. The definition in terms of known meteorological data of a profile index of refraction is discussed and a "conjugate power-law theory of eddy-diffusion" set out. *Subject Headings:* **1. Refraction of electromagnetic waves 2. Radio meteorology.**

5J–128 551.5:62

Clausse, R., **La météorologie au service de l'électricité.** [Meteorology in the service of electricity.] *France. Météorologie Nationale, Bulletin d'Information,* 3(15):11–14, Nov./Dec. 194 **DWB**—An account of EDF (Electricité de France) and the effect of weather on the production of energy by water power and the consumption (load). Special types of forecasts required are listed. *Subject Headings:* **1. Weather effects 2. Electrical engineering.**

5J–129 551.594.7:621.3

Perlat, Andrée, **Météorologie et radioélectricité.** [Meteorology and radioelectricity.] *L'Onde Électrique,* 28:44–54, **1948.** 18 figs. **DLC**—The first part of this article deals with the uses of radio and radar in meteorology. Pt. 2 describes with diagrams the effect of meteorological phenomena on the propagation and refraction of waves of frequency exceeding 60 Mc/s. Factors considered are variation of refractive index with height, effect of turbulence, advection, nocturnal cooling, fog, subsidence, fronts and the formation of ducts. *Subject Headings:* **1. Radio transmission duct 2. Refraction of electromagnetic waves 3. Radio meteorology.**

1949

5J–130 551.574

Bürklin, A., **Die Beanspruchung der Freileitungen durch Eisbehang.** [The strain on the conductors by ice accumulation.] *Elektrotechnische Zeitschrift,* Wuppertal, 70(17):481–486, Dec. **1949.** 12 figs., 12 refs., eq. **DLC**—Investigations in the Riesengebirge have shown that the

load agrees well with the V D E (Verband Deutscher Elektrotechniker) formula. It is especially noteworthy that lines 400 mm apart do not freeze together in the worst conditions. Also they very rarely break under the load, if poles are so arranged that conductors do not come too near each other or to the poles. Special treatment must be given to conductors in regions especially subject to rime. *Subject Heading:* **1. Icing of cables.**

5J–131 551.5:621.311

Dryar, Henry A., **Load dispatching and Philadelphia weather.** *American Meteorological Society, Bulletin*, 30(5):159–166, May **1949.** 8 figs. Comments by A. E. Davison, p. 166–167. **MH-BH**—Contents: Weather a general problem to power systems. Load estimating. Effect of weather on load demands—consistent base load a requirement. Weighting the weather (weights assigned +2% for each 5°F above or below 65°, +2% for each 5 mi/hr wind speed, +3% for total cloud, but — for thin cloud). Measuring the weather elements. Load estimating and weather forecasting. Base load indicates trend. Daily capacity schedule. Segregating weather variable unveils other variables. Measurement of effects of sky conditions. (*Same item as* 2.6–11, June 1951, *MAB.*) *Subject Headings:* **1. Industrial meteorology 2. Power systems. I. Davison, A. E.**

5J–132 551.571:621.31

Ford, L. H., **The effect of humidity on the calibration of precision air capacitators.** *Institution of Electrical Engineers, Proceedings*, Pt. 3, 96(39):13–16, Jan. **1949. DLC**—3 figs., 2 tables, 8 refs. Measurements were made at a frequency of 1000 c/s of the capacitance changes in air capacitors (condensers) at temperatures of 15–25°C. In a range of relative humidity from 30–65% the capacitance increases by up to 3 parts in 10,000, due to adsorption of moisture on the plates and solid dielectric. *Subject Headings:* **1. Humidity effects 2. Electrical engineering.**

5J–133 551.594.221:621.315/6

Lacey, H. M., **The lightning protection of high-voltage overhead transmission and distribution systems.** *Institution of Electrical Engineers, Proceedings*, Pt. 2, 96(50):287–299, April **1949.** 12 figs., 2 tables, 12 refs., 7 eqs. Discussion p. 299–307. **DLC**—A summary is given of knowledge of lightning currents and lightning surges, types (five) and amplitudes of surges, attenuation, surge propagation, distribution of surge voltages in inductive apparatus, and effects of surges on insulation. The last half of the paper classifies recognized protective devices and sets out a number of recommendations and suggestions for further research. *Subject Headings:* **1. Lightning 2. Electrical engineering.**

5J–134 551.594.7:621.396

Perlat, A., **Effet des conditions météorologiques sur la propagation des ondes radioélectriques a fréquence élevée. Note preliminaire.** [Effect of meteorological conditions on the propagation of high-frequency waves. Preliminary note.] *Journal Scientifique de la Météorologie*, 1(4):131–138, **1949.** 8 figs., tables. **Cas des ondes de 150 Mc.** [Case of waves of 150 Mc.] *Ibid.*, 2(8):101–107, Oct.–Dec. **1950.** 3 figs. French, English and Spanish summaries p. 131, 101. **DWB**—The first memorandum discusses the meteorological conditions for the existence of ducts giving abnormally large reception range of waves shorter than 10 m, making use of radiosonde ascents. In the second paper several cases of very abnormal range (300–400 km) of 2 m waves in Western Europe are examined. They appear to require the presence of a subsidence area, pressure above 1013 mb and vapor pressure above 11 mb, and no fronts across the track. *Subject Heading:* **1. Radio transmission ducts.**

1950

5J–135 551.594.221:621.315/6

Forrest, J. S., **The performance of the British grid system in thunderstorms.** *Institution of Electrical Engineers, Proceedings*, Pt. II, 97(57):345–364, June **1950.** 9 figs., 13 tables, 20 refs. Discussion p. 356–364 and Pt. II, 97(60):835–854, Dec. **1950. DLC**—The paper analyzes 1157 faults due to lightning in 14 years on 5900 miles of the British grid. Incidence varies from 1 fault per 100 mi per year on 132 KV lines to 3.8 on 33 KV lines. Diurnal and seasonal frequency of faults is studied (maxima June–Aug. and 15–18h). The causes of breakdowns are studied and protective devices discussed. Long, mainly technical, discussions followed. On p. 358 S. Morris Bower gives revised figures of monthly and hourly thunderstorm frequency. *Subject Headings:* **1. Lightning 2. Electrical engineering 3. British Isles. I. Bower, S. Morris.**

1951

5J–136 551.575:621.315/6

Cochet, Robert, **Contribution à l'étude des pertes par brouillard dans les lignes de transport d'énergie électrique à haute tension continue.** [Contribution to the study of fog losses in high

tension cables.] *Académie des Sciences, Paris, Comptes Rendus*, 232(25):2295–2297, June 18, 1951. fig., eqs. **DWB**—The capture of droplets of water, carried in a current of air, by a cylindrical conductor, is examined. It is shown mathematically that the coefficient of capture is determined by the relation of the trajectories of the particles to the diameter of the cylinder. *Subject Headings:* **1. Fog droplets 2. Electrical engineering.**

5J–137 551.556:621.315.1 551.524.3:621.315.1

Datta, M., **Standardization of wind pressure and temperature variations as regards the design of overhead lines with particular reference to conditions in West Bengal.** *Indian Journal of Physics* 25:279–286, **1951.** 4 tables. **DLC**—Argues that existing regulations governing overhead line design are based on climatic data that are not applicable to West Bengal, and that costs could be cut. A modified formula is proposed. Tables give monthly extremes of temperature (1941–1947) and maximum wind speeds (1939–1947) for Alipore. It is observed that severe wind loads do not occur at times of low temperatures, but in summer squalls. *Subject Headings:* **1. Wind pressure 2. Temperature changes 3. Electrical engineering 4. West Bengal, India.**

5J–138 551.515:621.

Forrest, J. S., **Weather and electrical research.** *Weather* 6(9):262–266, Sept. **1951.** 2 figs. 7 refs. **DWB**—Popular account including effect of weather on heating and lighting load, research on disturbances due to lightning, on high-power losses by brush discharge and on insulation against leakage. *Subject Headings:* **1. Applied meteorology 2. Electrical engineering.**

5J–139 551.5:621.311(748

Stephens, F. Briscoe, **A method of analyzing weather effects on electrical power consumption.** *American Meteorological Society, Bulletin*, 32(1):16–20, Jan. **1951.** 4 figs., 2 tables, 3 refs. **MH-BI**—After major effects on power consumption (such as seasonal, weekly or diurnal variations and changing economic or social factors) are discovered and eliminated from time series, it is possible to evaluate the effects of such weather elements as cloudiness on power load. If this factor is then removed from the data, other weather factors can be evaluated more easily. Data for State College, Pennsylvania, for 1947 was used in this statistical study. (*Same item as* 2.9–5, Sept. 1951, *MAB*) *Subject Headings:* **1. Industrial meteorology 2. Power consumption 3. State College, Pennsylvania.**—*M.R.*

1952

5J–140 551.594.221:550.372:621.316.9

Fritsch, Volker, **Geoelektrische Untersuchungen an Blitzerden.** [Geoelectric investigation of lightning earths.] *Beiträge zur Geophysik*, 62(3):164–207, **1952.** 45 figs., tables, eqs. **DLC**—This elaborate memoir begins with an account of the technique of high-frequency measurement of ground resistance, circuits, apparatus and methods. Pt. 2 describes the investigation of earths of different types, rods, sheets and deep earths, in different soils. Pt. 3 deals with changes of resistance during the year, and the effect of frost, snow, rain, dew and thunder. This is only part of a more extensive program. *Subject Heading:* **1. Lightning protection.**

5J–141 551.585:621.31

Marsch, Oskar, **Klimatische Erprobung von Werkstoffen und Geräten der Nachrichtentechnik.** [Climatic testing of materials and apparatus of communication technique.] *Siemens Zeitschrift* 26(5):233–239, July **1952.** 16 figs. **DLC**—Apparatus for rapid communication over long distances must function in all climates. This paper describes, and illustrates with photographs, testing rooms in Berlin simulating the hot humid tropics (40°C, 90% R.H.), hot dry desert (55°C, 25%), intense solar radiation, arctic and high level climate (−60 to +100°C), mechanical vibration (effect on transport), moulds and insects. Insulation and electrolytic attack of metals in electric switches are especially considered. Types of damage to which different materials such as alkaline glass, wood pulp and insulating paper are liable, are discussed. *Subject Headings:* **1. Climatic effects 2. Electrical engineering.**

5J–142 551.582(494):621.31

Roesgen, E., **Météorologie et diagrammes de charge.** [Meteorology and load diagrams.] *Genève. Services Industriels, Bulletin*, 4(3):5–8, **1952.** Unchecked.—Daily consumption of electricity in Geneva and the maximum daily power are related to wind, temperature and cloudiness. Graphs are given illustrating the results obtained. *Subject Headings:* **1. Power consumption 2. Switzerland.**

1954

5J–143 551.5:621.396.0

Randall, D. L. (*National Bureau of Standards, Washington, D. C.*), **A study of some of the meteorological effects on radio propagation at 96.3 Mc between Richmond, Va. and Washington**

D. C. *American Meteorological Society, Bulletin*, 35(2):56–59, Feb. **1954.** 4 figs., 4 refs. **MH-BH** —This study was made to investigate the relationship of surface meteorological data and correspondng surface refractive indices to radio field strengths in the FM frequency band. For meteorological bservations during which the wind speeds were equal to or greater than 10 mph, and when fronts, ow overcast clouds (less than 5000 ft), rain, thunderstorms and fogs were excluded, a 0.70 correlation oefficient was found between hourly surface refractive index and hourly median field strength over Washington-Richmond path at a frequency of 96.3 Mc. *Subject Headings:* **1. Meteorological ffects 2. Short wave radio propagation 3. Refractive index 4. Richmond, Va. 5. Washington, D. C.**—*Author's abstract.*

E. SOURCES OF POWER—SUN, WIND, WATER

1933

5J–144 551.556.3:621.311.24

Brown, C. A. Cameron, **Windmills for the generation of electricity.** Oxford, University. nstitute for Research in Agricultural Engineering. Jan. **1933.** 15 p. 5 figs., 5 tables, 9 refs. **GB-MO**—Summarizes and extends the Institute's *Bulletin*, No. 1, 1926. Nine types of windmill ere tested at Harpenden. The output of each plant for 12 months is tabulated as a total and for ifferent wind speeds. The main advance since 1926 is the high-speed wheel with aerofoil-section lades. *Subject Headings:* **1. Wind generators 2. Harpenden, England.**

1939

5J–145 551.521.1:621.1

Brooks, F. A., **Use of solar energy for heating water.** *Smithsonian Institution, Annual Report,* **939.** General Appendix: 157–181. 3 plates, 10 figs. **DLC**—The availability of solar energy is rst discussed, then experimental work at the California Agricultural Experimental Station on ifferent types of solar water heaters is described. Recommendations are given for construction nd installation of heaters, and for their combination with other water heating systems. *Subject leading:* **1. Solar water heaters.**

1941

5J–146 551.521.1:621.47

Hottel, H. C., **Artificial converters of solar energy.** *Smithsonian Institution, Annual Report,* **941.** General Appendix: p. 151–162. 8 refs. **DLC**—Rough calculations are given to show utilization of solar power to be economically feasible but with little margin for optimism. The imple conversion of solar energy to heat is first considered and indicates need for study into the actors involved in design of collectors. The possibilities of photo-electric and photo-chemical ethods using photogalvanic cells are then outlined. *Subject Headings:* **1. Solar heating 2. Solar urnaces.**

5J–147 551.521.1:621.47

*†Jaumotte, A., **L'utilisation de l'énergie solaire.** [Utilization of solar energy.] *Ciel et Terre,* Brussels, 57(9):371–388, Sept. **1941.** 5 figs., 2 tables, 44 refs. **DWB**—The effects of the terrestrial tmosphère and of local conditions on the transmission of solar radiation and some of the difficulties f utilizing the solar energy are first discussed. A historical survey is then made of attempts by ARCHIMEDES (212 B.C.) and other workers through the centuries to overcome the difficulties. Recent work in Tunisia and at the Mount Wilson Observatory is described in some detail. *Subject Headings:* **1. Solar constant 2. Solar furnaces.**

1942

5J–148 551.556.3:621.311.24

Eredia, Filippo, **Il problema italiano dell'utilizzazione del vento.** [The Italian problem of wind utilization.] *Società Meteorologica Italiana, Bollettino,* No. 4, **1942.** 11 p. table. Abstracted from reprint. **NNA**—The principles of obtaining electrical energy from wind motors are set out and the cost per kw-hr estimated; in Italy it compares favorably with coal-driven motors. *Subject Headings:* **1. Wind generators 2. Italy.**

5J–149 551.556.3:621.311.24

Friedrich, A., **Die Windkraft in der europäischen Grossraumwirtschaft.** [Wind power in the large-scale European economy.] *Reichsarbeitsgemeinschaft "Windkraft," Denkschrift,* No. 5:11–38, Oct. 1, **1942.** 8 tables. Kloss, Max, **Der direkte Antrieb von Synchrongeneratoren durch Gross-Windkraftwerke im Parallelbetrieb mit einem taktgebenden Netz.** [The direct drive of synchro-generators by large wind power machines in parallel with a timing connection.] *Ibid.,*

39–58. 5 figs., 25 eqs. Noetzlin, — and Bentert, —, **Die Windkraftanlage Gutehoffnungshütte Teubert.** [The wind power installation "Gutehoffnungshütte-Teubert."] *Ibid.*, 59–64. 7 figs **DLC**—These three papers indicate the great interest in wind power in Germany. FRIEDRICH sets out the great power needs of the world and especially of "Greater Germany," which doubl every 10 years. He then sets out the possibilities and limitations of wind power, depending o location, season, time of day, height above ground and diameter. General descriptions are give of economics of small, medium and large installations, and evaluation of the possible part of win power in Europe. The work ends with some useful tables. KLOSS goes into the technical problem of synchronized *vs.* non-synchronized generators, NOETZLIN and BENTERT give technical details of new installation. *Subject Headings:* **1. Wind generators 2. Germany. I. Kloss, M. II. Noetzli —. III. Bentert, —.**

5J–150 551.521.1:621.4

Jaumotte, A. and François, G., **Deux transformations indirectes de l'énergie solaire en énergi électrique.** [Two indirect transformations of solar energy into electrical energy.] *Ciel et Terr* 58(7–8):227–235, July–Aug. **1942.** 10 figs., 7 refs. **DLC**—The authors describe two methods transformation. The first, proposed by BERNARD J. DUBOS, employs an ascending current of war air as the motivating force for the turbine. A theoretical value of the speed of the air at the upp end of the tube is computed. The second method, studied by PIERRE GANDILLON, is the metho of keeping a large water surface at a constant level by a fall of water to replace evaporation losse the fall of water being used to activate the turbine. *Subject Headings:* **1. Energy sources 2. Sol energy utilization. I. Dubos, Bernard J. II. Gandillon, Pierre.**

1943

5J–151 551.521.1:621.

Abbot, Charles G., **Solar radiation as a power source.** *Smithsonian Institution, Annual Repo* **1943.** General Appendix: 99–107, 3 plates, 3 figs. **DLC.** Reprinted from the *Military Engine* Wash., D. C., 35(208), Feb. **1943. DLC**—Early experiments are briefly described. Author th discusses the advantages and disadvantages of materials for mirrors and methods of eliminati heat losses from boilers and argues that in solar-power machines boiler temperatures should n greatly exceed 200°C or heat losses by radiation and convection become serious. A model is scribed in some detail, its over-all efficiency of conversion being estimated as 16.2 per cent. *Subj Heading:* **1. Solar furnaces.**

5J–152 551.556.3:621.311

Dieterich, G., **Grosswindkraftwerke.** [Large wind power installations.] *Reichsarbe gemeinschaft "Windkraft," Denkschrift*, No. 6:3–7, **1943.** Kleinhenz, Franz, **Das Gross-Win kraftwerk MAN-Kleinhenz.** [The Kleinhenz large wind power installation.] *Ibid.*, 7–18. 8 fi Kleinhenz, F., **Gewichts- und Kostenvergleich von Grosswindkraftwerken verschiedener Hö bei gleichem Windraddurchmesser.** [Comparison of weight and cost of large wind power instal tions of different height for the same vane diameter.] *Ibid.*, 19–29. 6 figs., tables. König, Geo **Der Windstromautomat 5–7.5 kW in Bornim-Potsdam.** [The automatic wind generator. . . *Ibid.*, 30–35. 3 figs. Op de Hipt, Herm., **Vergleich der Wirkung dreier Windfahnen.** [Co parison of working of three wind vanes.] *Ibid.*, 36–39. 8 figs. **DLC**—DIETERICH sets principles of construction of wind generators of over 5000 kw, designed to use winds of 8–20 m at heights of over 200 m. KLEINHENZ describes an installation of 20,000 kw, which can supplem power from coal and water. In his second paper KLEINHENZ goes into cost of construction a maintenance. A tower of about 200 m is most economical to build (485 RM/kw), one of 250 to run (3.25 Pf/kw-hr). KÖNIG describes and illustrates a small light 3 bladed installation suita to the light winds of Bornim, which starts up in a wind of only 1 m/s. OP DE HIPT compares mechanics of wind vanes: a) straight, b) wedge shaped and c) Odeh vane with staggered surfac compensated for turning moment of the blades. The latter has less side pressure and is theref less liable to damage. *Subject Headings:* **1. Wind generators. I. Kleinhenz, Franz II. Kör Georg III. Op de Hipt, Herm.**

5J–153 551.556.3:621.31

Grenet, G. and Joset, A., **Utilisation de l'énergie du vent pour l'alimentation en électri des observatoires de montagne.** [Utilization of the energy of wind to supply electricity to mount observatories.] *La Météorologie*, **1943.** p. 194–200. fig., table. **DLC**—Characteristics of types of wind generators are set out. At Puy-de-Dôme a helix of 1.80 m diameter gives 1 with a wind of 15 m/s, which suffices for ordinary purposes. Successful trials have been made Contadour on Mt. Ventoux (1200 m) using a helix 1 m in diameter. Robust construction is sential and limits size. *Subject Heading:* **1. Wind generators.**

1947

5J–154 551.521.1:697

Hawkins, Harold M., **Domestic solar water heating in Florida.** *Florida. University. Engineering and Industrial Experiment Station, Gainesville, Bulletin*, No. 18, Sept. **1947.** 26 p. 10 figs., 5 tables, 20 refs. **DWB**—The principles of solar water heaters are discussed and illustrated by means of schematic diagrams and photographs. Percentage of solar radiation absorbed, reflected or transmitted in winter and summer in Florida shown diagrammatically. Details of construction, installation, operation and the economies of solar water heating in northern and southern Florida thoroughly treated. Many hundreds of installations have been successful there. (*Same item as* 2.5–92, May 1951, *MAB.*) *Subject Headings:* **1. Solar water heaters 2. Florida.**—*M.R.*

5J–155 551.556.3:621.311.24

Kloss, M., **Probleme in der elektrischen Anlage von Windkraftwerken.** [Problems in the electrical installation of wind power machines.] *Technik*, Berlin, 2(11):471–479, Nov. **1947.** 2 figs. **DLC**—The technical problem discussed is the difficulty of maintaining constant potential and frequency. An automatic guard against overloading is described. *Subject Heading:* **1. Wind generators.**

5J–156 551.556.3:621.311.24

Pantell, K., **Gedanken über die Weiterentwicklung der Windkraftmaschinen.** [Ideas on the development of wind power machines.] *Technik*, Berlin, 2(11):480–482, Nov. **1947.** table. **DLC**—An introduction on the history of windmills and wind power machines ends with the application of aerodynamics to the form of the vanes. The present position is that rapidly revolving turbines have been developed for small pumping installations, limited to vane diameter of 12–15 m, and larger machines up to 30 m diameter for generating electricity. The peculiarities of wind, namely wide and rapid variations of speed and direction and low average speed, are considered. A table of performance of various types of blade systems shows that for a diameter of 10 m and a mean wind speed of 7 m/s a 3 blade system with an edge speed 5 times wind speed gives the best results (8 kw). Future developments in the direction of blade systems of greater diameter are possible; including systems rotating on a horizontal axis, but author considers that probable future development is rather trains of blade systems of the most favorable diameter for the prevailing winds. *Subject Heading:* **1. Wind generators.**

5J–157 551.556.3:621.311.24

*Witte, H., **Der Stand der Windkraftausnutzung.** [The position of wind power utilization.] *Technik*, Berlin, 2(11):465–470, Nov. **1947.** 10 figs., 3 tables. **DLC**—Shortage of coal in Germany makes use of wind power imperative. Available wind power is summarized in a chart of percentage frequency of winds (force 4–8) and frequency table of different wind speeds; with examples of gusts and squalls, and increase of wind speed with height above ground. Best loading conditions, represented by $(v^3/27)(D^2\pi/4)$ are evaluated for different wind speeds (v) and diameter (D), and the useful work of small and large wind power installations calculated. Wind blades are classified and, finally, the economics of wind power are compared with those of water, coal and oil. *Subject Headings:* **1. Wind generators 2. Germany.**

1948

5J–158 551.506:551.555(498)

*Cisman, Alex and Botan, N. V., **Consideratiumi asupra posibilităţilor de folosire a energiei vîntului în România.** [Considerations of the possibility of utilizing wind energy in Romania.] *Revista Stiintifică*, Iasi, Rumania, 34(1/2):35–42, Jan./June **1948.** fig., 4 tables, ref. **DLC**—In order to evaluate the efficiency of proposed wind generators (similar to those installed in Crimea by the Soviet Union), wind data for a score of stations in Romania are presented and discussed. A chart shows the windy portion of Romania. Percentage of calms, minimum annual values, mean values and estimated percentage of time the generators would operate are given in tables by seasons for each station. (*Same item as* 6–68, June 1950, *MAB.*) *Subject Headings:* **1. Wind data 2. Wind generators 3. Romania.**—*M.R.*

5J–159 551.556.3:621.311.24

*Putnam, Palmer Cosslett, **Power from the wind.** Toronto, Van Nostrand, **1948.** 224 p. 113 figs., 23 tables, bibliog. p. 213–217 (57 items). **DWB**—A complete book giving in 13 chapters the history and the scientific and technical results of the Smith-Putnam wind turbine Project of 1934–1945. The huge wind generator designed by the author and THOMAS S. KNIGHT was erected and operated on Grandpa's Knob, 12 mi west of Rutland, Vermont. The turbine generated 1200 kw and fed power into the network of central Vermont utilities whenever the wind was >17 mph. This was the first time wind had been used to drive a synchronous generator feeding into a utility

network. Costs were about equal to water or steam power generators. The wind survey of Ne England used in establishing the site was made by SVERRE PETTERSSEN, the aerodynamic characte istics of the plant by TH. VON KÁRMÁN. In Chap. II the results of the preliminary wind surve made by PETTERSSEN are given in tables and world wide or local (U.S.A.) charts. The ocean area are most uniform and wind power data for these and adjacent land areas easily calculated. Th areas with <2000–2500, 3000–3500, –4000, –4500, –5000, –6000 and <6000 kw-hr/kw/year a listed and shown on a map. The best site in Vermont was selected from results of pilot ballo and wind-tunnel tests, and from a knowledge of synoptic meteorology and climatology of the Ne England area. Structure of wind and geometry of mountain were carefully considered but the da proved insufficient, so a network of anemometers was set up on 14 mountain tops to the north a south of Grandpa's Knob. These were placed at 75–80 ft above ground at all 14 stations, and oth anemometers at varying heights from 40 to 85 ft above ground. Height above trees was also co sidered, and vertical velocities were measured at 4 of the stations. The program from 1940–45 established by PETTERSSEN, assisted by WILLETT, ROSSBY, C. F. BROOKS and KARL O. LANGI reviewed in Chap. III and a selection of pertinent data and analysis thereof given in Chap. I It is pointed out that only a small portion of the data have been analyzed, but they are all availa for anyone who needs them. Vegetation was used as an important and reliable indicator of p vailing direction, force and character of the wind on mountain slopes. Wind tunnel tests prov unreliable. Nearly every aspect of the wind, as to mean and instantaneous conditions, is consider in this book. *Subject Headings:* **1. Wind power projects 2. Wind surveys 3. Vermont.**—*M.R.*

5J–160 551.521.1

Trombe, Félix; Foëx, Marc and Henry La Blanchetais, Charlotte, **Utilisation de l'éner solaire.** [Utilization of solar energy.] *France. Centre National de la Recherche Scientifiq Journal des Recherches*, 2(4–5):61–89, **1948.** 35 figs., 9 tables, 12 refs. **DLC**—The authors su marize early attempts made by BUFFON, CASSINI, TSCHIRNHAUSEN, LAVOISIER and MOUCHOT utilize solar radiation for producing high temperature. Table of intensity of direct solar radiat at Sainte-Maur at the middle of each month and maps showing total number of sunshine hours year in France and monthly duration of insolation for Jan., April, July and Oct. are presented. T theoretical temperature attainable by concentrating the sun's rays and the efficiency of mirror discussed. The authors describe the construction and operation of the solar furnace at Meud which is illustrated with diagrams and photographs. Temperatures as high as 3300°C have b obtained. This furnace has been used successfully in melting ThO_2, ZrO_2, MgO, TiO_2, Al_2O_3, e in melting chromium; in producing ammonic and nitric acid directly from their constituents an the continuous treatment of refractory substances to prepare melted specimens of appreciable s (*Same item as* 2.4–94, April 1951, *MAB.*) *Subject Headings:* **1. Solar radiation 2. Solar furna 3. Industrial meteorology 4. France.**—*I.L.D.*

1949

5J–161 551.556.3:621.31

Golding, E. W., **Large-scale generation of electricity by wind-power. Preliminary rep** *British Electrical and Allied Industries Research Association, Leatherhead, Surrey, Technical Re* C/T 101, **1949.** 15 p. 8 figs., 16 refs. **GB-MO**—Tests conducted on hills of suitable shap Orkneys gave mean wind speeds up to 15.1 mph in summer. Structure of wind on Costa H investigated up to 66 ft. Other trials in progress in North Wales and Cornwall. It is conclu that several hundred sites could be found in Britain for economical wind-driven generators giv 3500–4000 kw-hr/kw. More information required about flow of wind over hills. (*Same item* 2.1–120, Jan. 1951, *MAB.*) *Subject Headings:* **1. Wind utilization 2. Wind generators 3. Bri Isles.**

5J–162 551.552(410) 551.556.3:621.31

Golding, E. W. and Stodhart, A. H., **The potentialities of wind power for electricity generat with special reference to small-scale operation.** *British Electrical and Allied Industries Rese Association, Leatherhead, Surrey, Technical Report*, W/T 16. **1949.** 20 figs., 4 tables, 10 **GB-MO**—The object of the investigation was to determine from wind statistics for Great Bri the probable values of electrical power and energy available to a given size of wind turbine in va districts. Calculations were based on an arbitrary figure of 100 sq. ft. of area swept by the wheel. Investigation was primarily concerned with small-scale generation but large-scale wo was also considered. *Subject Headings:* **1. Wind distribution 2. Wind frequencies 3. W generators 4. British Isles.**

5J–163 551.556.3:621.31

Lacroix, G., **L'énergie du vent.** [The energy of the wind.] *Technique Moderne*, Paris, 41 77–83, March 1949; 41(7/8):105–111, April **1949.** 27 figs. **DLC**—Author points out pote

value of wind power in France, and proceeds with diagrams and explanation of the principles and construction of the various types: "panémones" with mobile surface normal to the wind, turbines, Flettner rotors and motor with vertical wings on a horizontal axis (aeromotors). Many different types are included. In Sec. 3 economic questions are discussed—cost of construction and maintenance, need for an auxiliary supply. Wind power is most useful in remote rural districts where fuel is costly. As an example the installation on Grandpa's Knob, Vermont (*see* 5J–159) is described. The article concludes with hope for the future. *Subject Heading:* **1. Wind generators.**

5J–164 551.556.3:621.311.24

Stumpf, Franz, **Energie aus der Luft.** [Energy from the air.] *Natur und Technik*, Vienna, 3(6):175–177, **1949.** 2 figs., photo, eq. **DLC**—Wind power generators described and illustrated. Quantitative data given for calculating power (kw) derived from winds of various speeds. (*Same item as* 9–98, Sept. 1950, *MAB.*) *Subject Headings:* **1. Wind generators 2. Computation tables.**—*M.R.*

1950

5J–165 551.509.58:621.311

Bardon, G., **Hydraulicité et énergie electrique.** [Hydraulic and electrical energy.] *La Météorologie*, No. 20:214–226, Oct./Dec. **1950.** 10 figs., plate. **DWB**—Long, medium and short term problems associated with hydro-electric power supplies are outlined in relation to the French system. The use of climatological statistics in long-term planning is described. The importance of forecasts is stressed for medium and short term planning. *Subject Headings:* **1. Industrial forecasting 2. Power consumption.**

5J–166 551.553.6

Borsuk, V. N., **K voprosu o metodike vetroenergeticheskikh raschetov.** [On the techniques of wind power calculations.] *Meteorologiia i Gidrologiia*, No. 3:57–59, Nov. **1950.** table. **DLC**—The author points out the deficiencies in the existing climatological wind velocity and frequency data from the standpoint of the utilization of wind power and shows that the method of POMORTSEV, by which wind frequencies at various elevations are calculated from mean annual wind velocities, yielded erroneous results. The method for determining reliable frequencies of wind velocities is presented. (*Same item as* 3.7–140, July 1952, *MAB.*) *Subject Headings:* **1. Wind power calculations 2. Wind frequencies 3. U.S.S.R.**—*I.L.D.*

5J–167 551.5:62(09)

Hartley, Sir Harold, **Man's use of energy.** *Advancement of Science*, London, 7(26):105–118, Sept. **1950.** **DLC**—The presidential address to the British Association's meeting held in Birmingham, England, in Sept. 1950. The president makes a historical survey of the uses made of energy and then considers possible future advances, touching briefly upon harnessing winds and tides, and utilizing solar radiation. *Subject Heading:* **1. Meteorological engineering.**

5J–168 551.579.1(02) 628.1

†*Hobbs, Aubrey Thomas (*ed.*), **Manual of British water supply practice.** Cambridge, W. Heffer & Sons [**1950**]. 910 p. 105 figs., 130 tables, 5 nomograms (in pocket), numerous refs. **DLC**—This work by 87 authors covers the whole field of water supply and water engineering in a most comprehensive way. It begins with chapters on historical development and fundamental considerations. Chap. 3, "Hydrology" (p. 58–96, 37 refs.), includes sections on rainfall, temperature, sunshine, humidity, wind and evaporation. Reliability of rainfall is studied on the statistical basis of the mean deviation. The other elements affect evaporation and runoff; the basic formula for the average annual loss of water is expressed as $4.8\sqrt[3]{R}$, where R is the average rainfall, but a more general formula for loss of soil water is $0.57\ R^{.87}+1.10(T-48)+.006(S-1450)$, T = mean air temperature, S annual sunshine in hours. Droughts are defined and the most severe described. Other formulas described intensity of heavy rainfall in terms of duration and area, flood formulas and flood hydrographs, reservoir storage and yield, etc. The remaining chapters deal with hydrogeology, all the various engineering aspects, hygiene, water softening, and the legal and financial aspects of water supply. (*Same item as* 2.8–127, Aug. 1951, *MAB.*) *Subject Headings:* **1. Water supply 2. Hydrology 3. Manuals.**—*C.E.P.B.*

5J–169 551.556.3

Peronaci, Francesco, **Rilevamento dell'energia del vento ai fini della sua utilizzazione mediante aeromotori.** [Determination of wind energy for the purpose of its utilization by wind machines.] *Annali di Geofisica*, 3(2):223–230, April **1950.** 7 figs. **MH-BH**—In order to install wind machines capable of generating electricity on a small scale the following wind data are required: the number of hours per year in which the wind velocity does not fall below a given strength, the frequency dis-

tribution of wind direction, and the intensity of squalls. The wind regime of several zones in Calabria is studied with reference to the possible installation of wind machines. (*Same item as* 2.1–121, Jan. 1951, *MAB.*) *Subject Headings:* **1. Wind generators 2. Wind utilization 3. Italy.**—*I.L.D.*

5J–170 551.5:621.

Reichel, E., **Elektrizitätswirtschaft und Wetterdienst.** [Electric power industry and weather service.] *Elektrizitätswirtschaft*, Göttingen, 49(7):204–208, **1950.** 4 figs., 2 tables. **GB-MO**—Examples of use of meteorological data in electricity supply are described. They include: 1) energy available in water power in various countries, and its reliability, 2) wind power, depending on wind speed frequency in various ranges, 3) leakage of power from high tension lines and risk of damage by lightning and 4) effect of weather on consumption. *Subject Headings:* **1. Industrial meteorology 2. Electrical engineering.**

5J–171 551.509.5:551.579(43

Reichel, E., **Wasserwirtschaft und Wetterdienst.** [Water economy and weather service.] *Wasserwirtschaft*, Stuttgart, 40:203–209, **1950.** table. **DLC**—Summarizes observation network in West Germany, warning services for water level and ice, forecasts and their application to water level, preparation and use of climatological statistics. All these services are set out schematically. *Subject Headings:* **1. Hydrologic forecasting 2. Germany.**

5J–172 551.579.

Thomson, Reginald W. S., **The application of statistical methods in the determination of the yield of a catchment from runoff data. With a statistical note by D. Halton Thomson.** *Institution of Water Engineers, Journal*, 4(5):394–428, Aug. **1950.** 8 figs., 14 tables. Lloyd, David, **Note.** *Ibid.*, p. 429–432. 2 figs. **MH-BH**—The general formula for runoff Y is simplified to $Y = Me \exp(vt)$ where Me is median runoff, v is coefficient of variation and t is the deviation from the mean when the distribution is transformed to a normal one. From Hazen's probability diagram and the expression, standard curves are constructed and used to determine the minimum anticipated yield from a catchment area. (*Same item as* 2.1–146, Jan. 1951, *MAB.*) *Subject Headings:* **1. Runoff 2. Catchment basins. I. Thomson, D. Halton.**

5J–173 551.5:06(47

Tomfel'd, N. P., **Gidrometeorologicheskoe obsluzhivanie narodnogo khoziaĭstva.** [The Hydrometeorological Service in the service of national economy.] *Meteorologiia i Gidrologiia*, No. 2:16–19, Oct. **1950. DLC**—A review of problems of the forecasting service of the national economy (exclusive of agriculture). The author indicates the principal features of reports and forecasts, which are needed for the service of the Ministries of Water and Air Transport, Fishing, Railways, Electric Stations and Communications. Among the most important are: the hydrologic characteristics of the river regime (heights of flood, runoff during flood period and later in summer season); forecasts of glazed frost, of storms, of snow storms, visibility, and of the heights and thickness of clouds. In conclusion, some benefits of the Weather Service during 1949–1950 for the lumbering and fishing industries are mentioned. (*Same item as* 3.9–19, Sept. 1952, *MAB.*) *Subject Headings:* **1. Hydrometeorological services 2. Weather forecasting 3. Industrial meteorology 4. U.S.S.R.**—*N.T.Z.*

1951

5J–174 551.508.5:551.556.3:621.311.

Rosenbrock, H. H. and Tagg, J. R., **Wind- and gust-measuring instruments developed for wind-power survey.** *Institution of Electrical Engineers, Proceedings*, Pt. II, 98(64):438–447, Aug. **1951.** 15 figs. **DLC**—The wind survey for which the instruments were developed was undertaken late in 1948. The essential information required was a record of mean wind speed over half-hour periods, recorded continuously, at a number of hill-top sites in each area considered. Two recorder and a gust anemometer are described. The first recorder is photographic and shows at half hour intervals the run of wind past four standard cup contact anemometers. The second records a mark for each two-mile run of wind, and can make up to four simultaneous records. Both can operate unattended for a week. The gust anemometer, which is compensated for temperature changes and static pressure effects, uses a perforated aluminium sphere as the detecting element and converts the mechanical response into electrical output by using an electronic transducer valve. *Subject Headings:* **1. Wind utilization 2. Wind recorders.**

1952

5J–175 551.521.1:621.47 551.556.3 621.

Marshall, C. W., **Supplementary sources of power: wind, volcanic heat, sun and tide.** *Royal Society of Arts, London, Journal*, 100(4873):452–464, May 16, **1952.** Discussion p. 464–468. 5 figs.

refs. **GB-MO**—The author surveys recent work on wind power, with special reference to the work of the Electrical Research Association in Great Britain, on volcanic heat, on thermal energy from the sea, on radiant solar energy particularly in America, and on tidal energy. *Subject Headings:* **1. Wind utilization 2. Solar furnaces 3. Tidal energy.**

1953

5J–176 551.556.3(439.1)

*Czelnai, Lajos, **A szélenergia felhasználásának néhány elméleti kérdése és lehetőségei hazánkban.** [Theoretical problems of wind energy utilization and its possibilities in Hungary.] *Időjárás*, Budapest, 57(4):221–227, July/Aug. **1953.** 4 figs., 4 tables, 4 refs. Russian and French summaries p. 221. **MH-BH, DLC**—Tables of monthly frequency distribution of wind speeds at 10 m above the ground and of seasonal frequencies of relative calm duration (<2 m/sec) are presented for Tiszaörs, eastern Hungary (1940–1941). It is found that a wind generator would be idle in that region during ⅓ of the time. A comparative table of seasonal average wind speeds (a value irrelevant in itself from the point of view of wind energy utilization) suggests that there are regions in Hungary where better wind conditions can be expected than in Tiszaörs. The author explains how to calculate useful energy from wind speed. He also gives a description of operational details of the wind generator at Ai Petri (Crimea) which is believed to be the world's largest. *Subject Headings:* **1. Wind power calculations 2. Wind utilization 3. Wind regime 4. Wind generators 5. Hungary.**—*G.T.*

5J–177 551.521.1:621.47

Ghai, M. L.; Bansal, T. D. and Kaul, B. N., **Design of reflector-type direct solar cookers.** *Journal of Scientific and Industrial Research*, 12A(4):165–175, April **1953.** 12 figs., 2 tables. 12 refs. **DWB**—A solar cooker developed at the National Physical Laboratory of India with the aim of low cost, simple operation and efficiency is described in detail. It consists of a paraboloidal reflector (effective face area about 10 sq. ft., focal length about 18 in.) adjustable to face the sun at any time, and a support for cooking utensils (preferably insulated pressure cooker with black bottom) placed in the focal point. Various size cookers are shown in photographs on different mountings. Data on loss of effective area at different solar altitudes for reflectors of different shape, on reflectivity and other properties of different materials and on absorptivity of some black surfaces are presented. *Subject Headings:* **1. Solar energy utilization 2. Solar cookers.**—*G.T.*

5J–178 551.521.1:621.47

Ghai, M. L., **Solar heat for cooking.** *Journal of Scientific and Industrial Research*, 12A(3):117–124, March **1953.** 7 figs., 10 refs. **DWB**—On the basis of a survey of literature, the author analyzes the amount of solar energy available for heat utilization. Solar cookers developed so far are considered under two groups: those based on direct absorption and accumulation of heat (hot-boxes) and those concentrating solar radiation (lenses, mirrors, reflectors). Sensitivity to sky radiation as well as direct radiation is stated as main advantage of hot boxes, while rapid effect, higher output and better adaptability to sun's position are credited to reflector-type devices. *Subject Headings:* **1. Solar energy utilization 2. Solar cookers.**—*G.T.*

5J–179 551.556.3

Golding, E. W., **Wind generated electricity for desert areas.** *Science Counselor*, Pittsburgh, 11:44–46, June **1953.** diagr. **DLC**—An account of the conditions in various parts of Israel which make wind power the only, or in some cases the most economical, form of power for various purposes (such as irrigation, farm lighting, etc.) The program being conducted there under the sponsorship of UNESCO is outlined in some detail. *Subject Headings:* **1. Wind power projects 2. Israel.**—*M.R.*

5J–180 551.521.1:621.47

Trombe, Félix, **L'utilisation de l'énergie solaire. État actuel et perspectives d'avenir.** [The utilization of solar energy. Present state and prospects.] *France. Centre National de la Recherche Scientifique, Journal des Recherches*, 25:193–215, Dec. **1953.** 34 figs., 37 refs. **DLC**—The author examines natural and artificial uses, the latter group being divided into uses not employing a concentration of solar energy and those that do. Natural uses—photosyntheses—are briefly discussed. Main emphasis is on artificial uses. Methods of heating houses and heating and distilling water are first outlined and then detailed attention is given to the employment of concentrations of solar energy, particularly for the production of high temperatures. A full description, complete with photographs, is given of the solar furnace installed at Mont Louis, in the eastern Pyrenees. Problems and future developments are discussed. *Subject Heading:* **1. Solar furnaces.**

1954

5J–181 551.521.1:621.47

Conn, Willi M., **Recent progress in solar furnaces for high-temperature research and development work.** *Franklin Institute, Philadelphia, Journal*, 257(1):1–12, Jan. **1954.** 4 figs., 11 refs. **DLC**—Advantages and disadvantages of solar furnaces are discussed. A modern furnace is described together with the methods used to permit the control and measurement of the temperature of a sample. A table gives the characteristic data for modern solar furnaces of various sizes. (*Same item as* 5.8–125, Aug. 1954, *MAB.*) *Subject Heading:* **1. Solar furnaces.**

5J–182 551.521.1:621.4

Daniels, Farrington and Morgen, Ralph, **Symposium on the utilization of solar energy.** *Science* 119(3081):82–83, Jan. 15, **1954.** Also in: *Current Science*, Calcutta, 23(5):141–142, May **1954**. **DWB**—The symposium was held at the University of Wisconsin, Sept. 12–14, 1953 and was attended by 40 selected scientists and engineers. No formal prepared papers were read. Discussion centered around 1) domestic uses, 2) power, 3) evaporation of sea water, 4) solar furnaces (which give temperatures up to 4400°C), 5) photochemical reactors (for storing solar energy), 6) electrical power from thermoelectric elements and 7) photosynthesis (as in plants). The need for tables or charts which would enable the engineer to determine the solar radiation available at any time at any place on the globe was expressed. Account of the Symposium also appeared in *Geofisica Pura e Applicata* 26:211–213, Sept./Dec. **1953.** *Subject Headings:* **1. Solar energy utilization 2. Electric power 3. Solar furnaces 4. Symposia.**—*M.R.*

F. CONSTRUCTION, LIGHTING, HEATING, AIR CONDITIONING AND VENTILATING OF BUILDINGS

(other than dwelling houses)

1927

5J–183 551.521.16:628.9

Great Britain. Dept. of Scientific and Industrial Research. Illumination Research, **Penetration of daylight and sunlight into buildings.** Its *Technical Paper*, No. 7, **1927.** 21 p. 11 figs. 15 refs. **GB-MO**—Defines "sill ratio" as a percentage of the illumination of a horizontal surface placed on the window sill of the room, all external obstructions supposedly being removed. Described method of computing this ratio and its relation to illumination. The figure of 500 ft candles is taken as the average condition of sky brightness in English towns in winter and for long periods in late autumn and early spring. Reflection and obstruction effects within and outside the room are considered. *Subject Heading:* **1. Daylight illumination.**

1934

5J–184 551.556:6

Harris, C. L., **Influence of neighboring structures on the wind pressure on tall buildings.** *U. S. National Bureau of Standards, Journal of Research*, 12(1):103–118, Jan. **1934.** 11 figs., 8 refs. **DLC**—Measurements were made over a model of the Empire State Building to determine shielding effects that might be expected from buildings that might be erected on neighboring plots. Results are given and analyzed. The author stresses the need to take into account, when designing tall buildings, the variations in the torsional moments about a vertical axis that the shielding can produce. *Subject Heading:* **1. Wind load on structures.**

1935

5J–185 551.521.16:628

Great Britain. Dept. of Scientific and Industrial Research. Illumination Research, **Seasonal variation of daylight illumination.** Its *Technical Paper*, No. 17, **1935.** 8 p. 7 figs., 3 tables, 2 refs. **GB-MO**—The paper gives results of a series of measurements of sky-light (excluding sunlight) made at the National Physical Laboratory over a period of 10 years. The measurements were made at 9.00, 12.00 and 15.00 G.M.T. The apparatus was so designed that the test surface of the illumination photometer received light from one octant of the sky only. The center lines of the selected octants pointed north, south east and west. Tables and figures give the illumination for each octant and for the whole sky for each of the four seasons. *Subject Heading:* **1. Daylight illumination.**

1938

5J–186 551.5:69

Hrudička, Bohuslav, **Meteorologie im Dienste der Bautechnik.** [Meteorology in the service of building technique.] *Zeitschrift für angewandte Meteorologie*, 54(2–3):37–47, 69–76; Feb., April, 1937; 55(4,9):110–119, 289–294; April, Sept. **1938.** refs., eqs. **DWB**—A general summary with references is given of the effect of smoke and SO_2 in towns on corrosion, loss of daylight through fog. Yellow street lighting is best. Rainfall with wind (Schlagregen) is important for its mechanical effect, direct and through freezing of water in pores in walls especially to windward. Climatic conditions determine minimum thickness of walls (from 22 cm in Holland to 71 cm in Russia), but atmospheric humidity and rainfall influence water content of walls and hence conductivity. Heat loss through walls is analyzed. For wind, prevailing direction and diurnal variation of velocity are important. Heating and ventilation are discussed, including calculation of heat requirements (day degrees), effects of water vapor in air conditioning, heat capacity of walls of different materials. Effects of soil, frost and insolation by snow are examined, also cement working in frost by supplying heat (mean requirement 1 kw-hr/degree/m²). Effect of wind on isolated and high buildings is considered taking account of variation of wind with height, risk of tornadoes, gustiness and effect of buildings and irregularities of surface on air currents and eddies, and wind pressure on buildings. Other factors considered in this comprehensive survey are snow load on buildings, effect of thawing and risk of lightning. (*See also* 3G–176, July 1952, *MAB.*) *Subject Headings:* **1. Building construction 2. Weather effects.**

1946

5J–187 551.521.16:72

Dufton, A. F., **Protractors for the computation of daylight factors.** *Great Britain. Dept. of Scientific and Industrial Research, Building Research Technical Paper*, No. 28, **1946.** 16 p. 11 figs. **DLC**—Daylight factor is defined as the ratio of the illumination received on a working plane at a point in a building to that received out-of-doors from the whole sky. The sky is assumed overcast. The working plane is taken as horizontal and usually 2 ft 9 in. above the floor. A description is given of special protractors devised to simplify computations, and to enable measurements to be made directly from the plans of a building. Auxiliary protractors are also described. These enable the introduction of correction factors as windows are not of infinite extent as assumed in the ideal case. *Subject Headings:* **1. Daylight illumination 2. Building design.**

5J–188 551.588.7:71

Geddes, Arthur, **Planning and climate. Climates of region, locality and site, and factors in lay-out.** *Association of Planning and Regional Reconstruction, London, Report*, No. 38, **1946. GB-MO**—Discusses siting of buildings in a town in relation to local climate and purpose. Thus business premises occupied only by day may be located in a hollow where extremes are greatest; residential districts should be on slopes, preferably in the neutral zone between katabatic and prevailing opposing wind. (*Same item as* 3G–196, July 1952, *MAB.*) *Subject Heading:* **1. Town planning.**

5J–189 551.524.36(42)

*London and Counties Coke Association, **Degree days, their use and application for checking and computing fuel consumption.** London, **1946.** 20 p. 9 figs., tables, 7 refs. **GB-MO**—Fuel consumption in Thames valley is roughly proportional to degree days below 60°F. A graph is given for estimating fuel consumption and accuracy of calculations discussed. Monthly normal degree day totals for 14 districts of Britain are tabulated. Calculation of degree days from mean daily maximum and minimum temperatures is illustrated and an extensive folding table given. *Subject Headings:* **1. Degree days 2. Fuel requirements 3. British Isles.**

1947

5J–190 551.524.36:697(437)

Pokorný, Václav, **Vliv teploty venkovního vzduchu na spotřebu paliva k vytápění.** [The influence of the temperature of the outside air on the consumption of fuel for heating purposes.] *Meteorologické Zprávy*, Prague, 1(3):52–57, **1947.** 4 figs., 2 tables, 4 refs. In Czech. **DWB**—Diurnal variation of temperature on clear and overcast days is discussed and formula $(7+14+2\times21\text{ h})/4$ recommended for mean. Recommended temperatures for different types of building are tabulated and heating procedure set out (starting heating when outdoor mean falls below 12°C) with formulas for calculating amount of fuel required, taking account also of outdoor humidity and especially wind and the penetration coefficient of the walls. A graph relates loss of heat to air temperature and wind speed. It is recommended that the rate of cooling be determined with a katathermometer. *Subject Headings:* **1. Temperature variations 2. Fuel requirements 3. Czechoslovakia.**

5J–191 551.521.6:697

†Tasker, Cyril, **How infra-red radiation is used for space heating.** *Heating, Piping and Air Conditioning*, 19(10):104–106, Oct. **1947. DA, DWB**—A review of two papers, Mackadam, A. D. F. and Janser, A. M. J., **Specific effects of infrared.** *Institution of Heating and Ventilating Engineers, London, Journal*, 13(129):38–64, May/June **1945.** 26 figs., 5 tables, refs., 12 eqs. And Janser, A. M. J., **Infrared in relation to space heating.** *Ibid.*, 14(138):320–352, Nov./Dec. **1946.** 24 figs., refs., eqs. **DLC**—Review indicates that the articles contain material of interest for those concerned with radiant heating for industrial purposes and for human comfort. Comprehensive bibliography and description of advances in application of "infra-red." Review contains charts showing (1) transmission of radiation through water and the human skin, (2) relation of emissive power to temperature for black body, water vapor and CO_2, (3) black body radiation energy distribution at different radiant temperature, (4) radiant temperatures in relation to distance from black body radiator and (5) diagram of overhead radiant heater showing operation. Optimum condition for comfort probably lies around an air temperature of 55°F and a density of radiant flux around 75 Btu. per sq. ft. per hr. Possibilities and difficulties in developing equipment for industrial use. Reflectors, beams, gas radiants, reflective paints, convection currents set up with variable output. (*Same item as* 1–77, Jan. 1950, *MAB.*) *Subject Headings:* **1. Radiation 2. Heating and ventilating 3. Industrial meteorology.**

5J–192 551.521.1:697.

Telkes, Maria, **Solar house heating—a problem of heat storage.** *Heating and Ventilating*, New York, 44:68–75, May **1947.** 7 figs., 6 tables, 25 refs. **DLC**—Experimental set ups at M.I.T. for storing solar heat are described, using water heated on the roof and stored in the basement, black panel on roof for temporary air heating, and room with large double windows facing south. At Bule Hill the latter has a heating efficiency of 23% at 70°F; the use of an absorbing surface behind two glass plates, or roof collector with an insulating partition for use at night, raises this to 46–61% at 70°F. At higher temperatures efficiency is less. Water is most efficient heat storer, but storage can be greatly increased by using heat of fusion of Glauber's salt in sealed containers. In temperature range 100–80°F 1 ft³ can store 11,000 Btu (water 1300). Methods of house heating by solar heat stored by this method are described. *Subject Heading:* **1. Solar houses.**

1948

5J–193 551.521.1:69

Stewart, James P., **Solar heat gain through walls and roofs for cooling load calculations.** *Heating, Piping and Air Conditioning*, 20(8):121–128, Aug. **1948.** 3 figs., 4 tables, 12 refs. **DWB, DLC**—A simplified method is presented for determining heat gain through walls and roofs due to combined effects of solar radiation and air temperature difference. This is accomplished by tables of equivalent temperature differentials, in which all types of building construction are grouped under a few classifications. (*Same item as* 1–69, Jan. 1950, *MAB.*) *Subject Headings:* **1. Solar radiation 2. Applied meteorology 3. Heating and ventilating.**—*Author's abstract.*

5J–194 551.5:697(0)

*Strock, Clifford, **Heating and ventilating engineering databook.** New York, Industrial Press, **1948.** 576 p. 193 figs., 317 tables. **DLC**—An elaborate compilation of useful data, tables, nomograms, charts, definitions, equations, formulas, and instructions for calculating the effects of sun, temperature, humidity and wind on heat loss or gain within buildings. Extensive psychrometric tables and charts; temperature, degree-day and water temperature data and charts for scores of places in the United States; analytical solar radiation data for various latitudes or solar angles are among the data of interest to applied climatologist or meteorologist. Specifications for water vapor properties of air, thermometry, psychrometry, conduction, convection, radiation, the heat pump, snow melting, degree-days, insolation and comfort are amply provided. (*Same item as* 5–13, Mar. 1950, *MAB.*) *Subject Headings:* **1. Computation tables 2. Physical constants 3. Heating and ventilating 4. Handbooks.**—*M.R.*

1949

5J–195 551.524.36:66

Birks, F. M., **The characteristics of gas-making plant to meet the seasonal heating load.** [Reprint?] from *International Gas Conference, 4th, London*, **1949.** [*Proceedings?*] 13 p. 6 figs. English and French summaries p. 2–3. **GB-MO**—Frequency distribution of daily average temperatures below 41°F in London, 1928/9–1947/8 and load diagram for average, typical severe and typical mild winters are given. Suggestions are made for meeting the additional load. *Subject Headings:* **1. Degree days 2. Gas industry.**

5J–196 551.524.36:697

†Caemmerer, W., **Über den Mindestwert des Wärmeschutzes—eine kritische Betrachtung.** On the least value of heat protection—a critical consideration.] *Gesundheits-Ingenieur*, Munich, Berlin, 70(15/16):271–277, **1949.** 3 figs., 6 tables, 35 refs. **DBS**—Wall resistance and maximum permissible relative humidity to avoid condensation on the walls of occupied rooms, kitchens, etc. are set out for given inside and outside temperatures and rate of ventilation. In Germany a resistance of 0.55 m². °C/kcal for walls and 1.0 for roofs is the standard in DIN publications. The classification of climates from this aspect and that given by L. SAUTTER is discussed and a map is given. Security regulations for new buildings laying down a certain heat conduction resistance are criticized. Other types of building are considered. The effective temperature conditions (mean annual minimum, days with temperature below −10° and 0°C and number of heating days) are set out for a number of German stations. Economic aspects of improved heat protection are discussed. *Subject Headings:* **1. Degree days 2. Building construction 3. Germany.**

5J–197 551.524:697

Hottinger, Max, **Wärmewirtschaftliches Bauen unter Berücksichtigung der örtlichen Klimaverhältnisse.** [Building for heat economy with regard to local climate.] *Schweizerische Blätter für Heizung und Luftung, Zürich*, No. 3:99–104, **1949.** 6 figs., 4 tables, 3 eqs. **NN**—Table is given for 4 places in Switzerland showing heating days and day degrees G_t for different room temperatures. The annual fuel requirement per m² surface of a building is expressed as

$$B(\text{kg}) = (kG_tSt_v)/(H_u\eta),$$

where k depends on heat loss through walls in kcal/m²/°C, St_v = hours of use of building, H_u = heat yield of fuel and η = efficiency of heating apparatus (taken as 0.6). Values of B are shown in a diagram. The cost of fuel with walls of low conductivity must be added to amortization (taken as 6%) of building costs, and author calculates wall thickness for which total cost is least. Solid diagrams are shown for different places. He then goes into net saving by double glass windows compared with single glass (amounting to 30%) and summarizes all results in a comprehensive table. *Subject Headings:* **1. Temperature 2. Building construction 3. Heating 4. Switzerland.**

5J–198 551.586:551.524.36:697

Parkerson, William, **Seasonal performance factor of the heat pump.** *Heating and Ventilating*, 46(1):61–64, Jan. **1949.** 3 figs., table. **DWB**—Temperature frequency data for Chicago for 1935–1939 used to determine average running time for heat pump at various temperatures. Bimodal distribution shown, with distinct maximum at 34°F and secondary at 69°F. Such data available for 117 cities in the United States makes it possible to specify the "basic" temperature for air-to-air heat pumps for each city. The coefficient of performance for each type of pump combined with "basic" temperature would give the seasonal performance factor for each city and each type of heat pump. (*Same item as* 2.1–162, Jan. 1951, *MAB.*) *Subject Headings:* **1. Applied climatology 2. Heat pumps.**—*M.R.*

5J–199 551.524.3:662.6

Rose, D. G., **A background to some economic problems in the gas industry.** *Institution of Gas Engineers, Publication*, No. 352, **1949.** 33 p. 11 figs., 3 tables. **GB-MO**—Variations in the rate of gas consumption in London are studied in relation to time of day, season and mean air temperature °F, the latter relation being expressed as $(65-t)^{1.4}$, where t is expressed in degree days. A chart of temperature variations was drawn to show the normal and extremes of gas consumption in various periods, likely to be met with at any time of year. Numbers of days below a given temperature are also tabulated. *Subject Headings:* **1. Gas industry 2. Temperature effects.**

5J–200 551.510.42:551.588.7

†*Sheleĭkhovskiĭ, G. V., **Zadymlenie gorodov.** [Smoke in cities.] Moscow, Ministerstvo Komunal'nogo Khoziaĭstva, **1949.** 234 p. 96 figs., 44 tables, 72 refs., 328 eqs. **DLC**—The late author, who at the time of his death in 1948 was the outstanding Soviet authority on urban climatology and related problems, has put into this book a great amount of useful experimental as well as theoretical information on the dispersion of smoke and gases in cities or industrial areas. The harmful effects of bacteria and other aerosols are first emphasized. Methods of measuring and charting the horizontal and vertical structure of smoke emitted by a stack are treated in considerable detail. Several chapters give the theory of dispersion of smoke and gases under varying conditions of wind, lapse rate, turbulence, stack height, particle size, or type of gas. The theory is profusely supported by tables and charts based on empirical field or laboratory data. The chapter on laboratory models is of special interest. Most of the equipment used in laboratory experiments is illustrated and described and the results given in detail. Separate chapters deal with harmful effects such as bacterial spread, decrease in incoming UV radiation, illumination, visibility (day and

night), increase in fog, smoke and sootfall, corrosion of metals and building materials and harmfu action on plants and trees. Finally, a series of recommendations is presented for use in town plannin in the light of wind (frequency of direction and speed) and other meteorological conditions, and som useful tables of constants for over a hundred harmful gases or aerosols. A glance at the list references and the empirical curves indicate that the work is based on both native and foreig (German and British) data in about equal proportions, so that a considerable amount of origina Soviet work is here integrated with conventional atmospheric pollution and turbulent diffusio technology for the first time. Data for specific Russian cities (e.g., Leningrad, Moscow, Voroshilov etc.) as well as for London, Paris and vicinity, give a basis for quantitative evaluation of the variou parameters involved in town planning for smoke abatement and health improvement. (*Same item as* 3G–248, July 1952, *M.A.B.*) *Subject Headings:* **1. Urban climatology 2. Turbulent diffusio 3. Visibility 4. Smoke abatement 5. Public health.**—*M.R.*

5J–201 551.586:62:551.525.5:69(798

Spofford, C. M., **Low temperatures in inaccessible Arctic influence construction costs.** *Civ Engineering*, N. Y., 19(1):24–26, Jan. **1949.** illus. **DWB**—Climatic conditions in various part of Alaska given, along with frozen soil information, as affecting surveying, building constructio and other engineering problems. (*Same item as* 3–131, March 1950, *M.A.B.*) *Subject Heading* **1. Frozen soil 2. Applied climatology 3. Alaska.**—*M.R.*

1950

5J–202 551.521.1:6

Everetts, John, Jr., **The role of climatology in air conditioning design.** *Heating and Ventilatin* 47(3):73–76, March **1950.** 2 photos., 4 tables. **DLC**—The effect of solar radiation and hea storage on heating or cooling load, especially with different facing walls of houses, factories an theaters under different climatic conditions (Chicago, St. Louis and New Orleans), are discusse and illustrated. Value of climatic data stressed. (*Same item as* 8–53, Aug. 1950, *M.A.B.*) *Subje Headings:* **1. Solar radiation 2. Industrial climatology 3. Heating and ventilating 4. Buildin design.**

5J–203 551.556:6

Horne, Michael Rex, **Wind loads on structures.** *Institution of Civil Engineers, London, Journa* No. 3:155–178, Jan. **1950.** Paper No. 5757. 3 figs., 3 tables, 24 refs., eqs. **DLC**—Wind pressur are regarded as uniform static loads, positive on the windward and negative on the leeward side of structure. Available evidence is summarized on the effect of shape and size of the structure, t effect of variations in direction and velocity of natural winds, including eddies and convecti currents, and the wind characteristics for which allowance must be made in various parts of Britai Pt. 2 discusses estimates of the damage caused to a structure during a high wind, the duratio of the load necessary to cause collapse and the distribution of gusts in a natural wind. The derivati of a suitable design velocity is shown. Some numerical results are included but available data wind velocities and pressures are insufficient for full calculations. Pt. 3 sets out briefly gene conclusions and some suggestions for further research, including the design of a diaphragm pressu gage of more rapid response than the Dines anemometer. A great part of the data is based o GIBLETT, M. A., **The structure of wind over level country.** *Great Britain, Meteorological Of Geophysical Memoirs*, No. 54, 1932. *Subject Headings:* **1. Wind load on structures 2. Buildi construction.**

5J–204 551.582

Legget, R. F., **Climate and building.** *Royal Meteorological Society, Canadian Branch [Publi tions]*, 1(8), Nov. **1950.** 15 p. 2 photos, 9 refs. Mimeo. **DWB**—After summarizing research other countries, author refers to work on problems peculiar to Canada—construction in wint including ice pressure and properties of snow, National Building Code, design in relation to lo conditions such as heat flow in ground, weathering and heat and vapor loss. The use of test huts described. (*Same item as* 3.1–149, Jan. 1952, *M.A.B.*) *Subject Headings:* **1. Climatology 2. Buildi construction 3. Canada.**—*C.E.P.B.*

1951

5J–205 551.556.2:550.34:69(7

American Society of Civil Engineers, San Francisco, California Section and Structural E gineers Association of Northern California, **Lateral forces of earthquake and wind.** *Ameri Society of Civil Engineers, Proceedings*, v. 77, Separate No. 66, April **1951.** 38 p. 12 figs., 4 tabl 69 refs. **DLC**—This paper on lateral force provision for building codes, while mainly dealing wi earthquake forces, also includes a brief chapter on the effect of wind forces. Specifications of exist

rodes for computing wind stress are found to be satisfactory. Their use is explained briefly. *Subject Headings:* **1. Earthquake effects 2. Wind effects 3. Building resistance 4. California. I. Binder, Ruben W. II. Housner, G. W. III. Alford, J. L. IV. Guha, S. K. V. Ram, Gurdas.**—*G.T.*

5J–206 551.556:69:62

Bouquet, R., **Bases météorologiques et aérodynamiques, reglementations actuelles, problèmes connexes. (Action du vent sur les constructions.)** [Meteorological and aerodynamical bases for present regulations and related problems. (Wind action on construction).] *France. Ministère de l'Air, Publications Scientifiques et Techniques*, No. 251:11–64, **1951.** 43 figs., eqs. **DWB**—A substantial treatise on the origin and nature of wind movements, the effect of obstacles, surfaces of discontinuity, microstructure of wind, turbulence, vertical currents, wind measurements (cup, pressure, and hot wire anemometers), effect of wind on construction, aerodynamic considerations, actual laws and regulations (French, Belgian and English laws), related problems (snow, rain, etc.). The force rather than speed of the wind is the basis for most regulations. *Subject Headings:* **1. Engineering meteorology 2. Wind load on structures 3. Wind pressure 4. Atmospheric turbulence.**—*M.R.*

5J–207 551.521.3:69

*Dirmhirn, Inge and Sauberer, Franz, **Die Bedeutung der diffusen Himmelsstrahlung im Bauwesen. I. Teil: Freier Horizont.** [The importance of diffuse sky radiation in building design. Pt. I. Free horizon.] *Wetter und Leben*, 3(8):178–183, Aug. **1951.** 5 tables, 10 refs. **MH-BH**—Diffuse sky radiation is an important but neglected factor in lighting and heating buildings. Table 1 gives monthly means in cal/cm² for cloud amounts 0–10, heights 200–3000 m, on horizontal surfaces. Amounts on vertical walls facing N, E, S, W, are tabulated for clear and overcast days and their importance emphasized. (*Same item as* 3.5–178, May 1952, *MAB.*) *Subject Headings:* **1. Sky radiation 2. Building construction.**—*C.E.P.B.*

5J–208 551.508.59 551.556:69:62

Esquillan, M. N., **Application de régles edictées en 1946 par le Ministère de la Reconstruction et de l'Urbanisme.** [Application of the laws promulgated in 1946 by the Ministry of Reconstruction and Urbanism.] *France. Ministère de l'Air, Publications Scientifiques et Techniques*, No. 251:65–74, **1951.** 4 figs. **DWB**—Studies of wind and snow loads on hangars, with various directions and forces of wind, and amounts of snow are illustrated by schematic diagrams. A special type of wind instrument, which was devised by M. ROULLEAU to give a wind parameter more suitable for engineering purposes than conventional wind equipment does, is also described and illustrated. *Subject Headings:* **1. Engineering meteorology 2. Wind load on structures 3. Wind pressure instruments.**—*M.R.*

5J–209 551.501.42:551.521.32:72

Foxhall, William B. (*New York*), **Handling sun loads on buildings.** *Heating and Ventilating*, New York, 48(4):76–80, April **1951.** 5 figs., 3 tables, 8 refs. **DLC**—Author sums up methods of calculating sun loads as found in various recent publications. The construction of a chart showing the pathway of the sun at any latitude throughout the year is explained. Equations are presented for calculating angles of incidence, length and depth of shadow, eave overhang and solar intensity. Data for effective solar absorption by various paints and materials, heat transmission coefficient of glass and fraction of incident solar radiation through glass are given in tables. (*Same item as* 3.7–30, July 1952, *MAB.*) *Subject Headings:* **1. Sun loads 2. Solar radiation effects 3. Building materials 4. Air conditioning.**—*G.T.*

5J–210 551.556:69

Gandin, L. S., **O modelirovanii vetrovykh nagruzok na stroitel'nye sooruzheniia.** [Experimental models of wind load upon structures.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy*, No. 23(85):15–27, **1951.** 10 figs., 11 refs., eqs. **DLC**—An attempt to apply aerodynamic principles to an analysis of wind load upon structures. The author analyzes the air flow around a plane surface at different angles, the distribution of external pressure upon the cross section of a model of a hangar, the transfer of experimental model results to actual structures, the influence of openings in buildings upon the distribution of total pressure and the effect of barriers upon wind load. The discussion is theoretical. (*Same item as* 3.9–162, Sept. 1951, *MAB.*) *Subject Headings:* **1. Wind load on structures 2. Wind pressure 3. Wind structure.**—*I.L.D.*

5J–211 551.556:69:551.554

Gandin, L. S., **Problema vetrovykh nagruzok na stroitel'nye sooruzeniia kak zadacha prikladnoĭ meteorologii.** [The problem of wind load upon structures as a task of applied meteorology.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy*, No. 23(85):3–14, **1951.** fig., 12 refs.,

5 eqs. **DLC**—The author shows that the damage inflicted by winds upon structures is not the result of changes in wind load caused by sudden changes in barometric pressure but of changes of wind load depending upon the maximum wind speed, direction and structure of the wind. For high buildings, the change of wind load with elevation must be considered and the following formula is suggested, $\frac{q}{q_1} = \ln^2 \frac{z}{z} \Big/ \ln^2 \frac{z_1}{z_0}$. The problems of determining the wind profile of the resonance of structures and the regional distribution of maximum wind velocity in the U.S.S.R. are considered. (*Same item as* 3.9–163, Sept. 1952, *MAB.*) *Subject Headings:* **1. Wind load on structures 2. Wind pressure 3. Gusts 4. Wind structure 5. Applied meteorology 6. U.S.S.R.**—*I.L.D.*

5J–212 551.584.61:697.

Garston, England. Building Research Station, **The principles of natural ventilation of buildings.** Its *Building Research Station Digest*, No. 34, Sept. **1951.** 6 p. 6 figs. **DLC**—Ventilation is controlled partly by horizontal wind pressure and partly by "stack effect" (heated air leaving building at or near roof level and cool air entering near base). A method is given for calculating total air change rates and heat loss in buildings occupied by a number of people. Effect of shape of building (roof flat or ridged) is considered. *Subject Headings:* **1. Indoor climates 2. Ventilation.**

5J–213 551.525.5:6

Nees, L. A., **Pile foundations for large towers on permafrost.** *American Society of Civil Engineers, New York, Proceedings*, Vol. 77, Separate, No. 103, Nov. **1951.** 10 p. graphs, diagrs. **DWB**—Tests were made on adhesion of steel poles in permafrost in soils of various moisture content and temperatures. A safe value for most soils is 20 lb/sq in. A suitable design for foundation requires a minimum embedment of 20 ft and concrete pads against heat conduction. (*Same item as* 3.6–113, June 1952, *MAB.*) *Subject Headings:* **1. Building construction 2. Permafrost.**—*C.E.P.P.*

5J–214 551.521.3:551.521.

Parmelee, George V. and Aubele, Warren W., **Radiant energy emission of atmosphere and ground. A design factor in heat gain and heat loss.** *Heating, Piping and Air Conditioning*, Chicago 23(11):120–129, Nov. **1951.** 11 figs., table, eqs., append. **DLC**—Equations and experimental data obtained with a special radiometer are presented for low-temperature long-wave-length radiation exchange between buildings and the atmosphere and ground. Heat flow data on sunlit glass are presented graphically. Heat loss on cloudless night is compared with heat loss when sky is overcast. The factor of radiation exchange is adapted to design calculation purposes. (*Same item as* 3.11–13 Nov. 1952, *MAB.*) *Subject Headings:* **1. Terrestrial radiation 2. Heat exchange 3. Building design.**—*G.T.*

1952

5J–215 551.524.37:69(43

Gumiński, Romuald, **Meteorology as applied to architecture in winter.** *Przegląd Meteorologiczny i Hydrologiczny*, No. 1/2:108–115, **1952.** fig., table, 3 refs. In Polish. **DWB**—The annual number of frost days (minimum temperature <0°C), and ice days (maximum <0°C) and the difference are tabulated for a number of places in Poland and the differences are plotted. The distribution is discussed from the point of view of building activities. *Subject Headings:* **1. Frost frequency 2. Building construction 3. Poland.**

5J–216 551.556:

Kamei, Isamu, **Mathematical analysis method for wind pressure distribution of structure** [1952?] 18 p. diagrs., eqs. Mimeo. **DWB**—Models are set up and mathematical values compared graphically with experimental data for wind pressure distribution on the windward side of houses (with eaves, without eaves and for roofs having a curved surface) and on other surfaces of similar houses. The method is shown to be practicable and graphical methods are being devised to facilitate the mathematical computation. Considerations of turbulence are taken into account in the models. (*Same item as* 3.11–155, Nov. 1952, *MAB.*) *Subject Headings:* **1. Wind load structures 2. Turbulent flow.**—*M.R.*

5J–217 551.556

Kamei, Isamu (*Bldg. Res. Inst., Tokyo*), **Studies on wind pressure of buildings against natural wind.** [1952?] 27 p. +15 p. figs. Mimeo. **DWB**—The prevailing directions of storm winds (typhoon and extratropical cyclones) at numerous places in Japan were determined and are shown on a chart. The frequency of wind of certain force and duration from 16 directions is also analyzed. (Most typhoon and storm winds are S or SW except in N portion and in some peculiar topographic locations.) Twenty years of record were used. Geographical variation of wind load (pressure

on buildings and other factors shown diagrammatically or on charts. Deformations of wooden structures are due to pressure and vibration (due to turbulence). Sometimes gustiness does not conform to prevailing wind. Studies were made in field and in wind tunnels. Influence of neighboring houses and of slope of ground or exposure on a cliff, of weight of roof itself and of height are also considered. (*Same item as* 3.11–156, Nov. 1952, *MAB.*) *Subject Headings:* **1. Wind load on structures 2. Wind profiles 3. Local turbulence 4. Japan.**—*M.R.*

5J–218 551.556:69:016

†McCrea, J. D., **Wind action on structures.** *National Research Council of Canada. Div. of Building Research,* [*Bibliography,* No. 5], Dec. **1952.** 6 p. **DWB**—Some seventy references ranging in time from 1759 to 1952 are listed alphabetically by authors. American, British, Canadian, French and German literature, mostly on wind load calculations and experiments, is included. *Subject Headings:* **1. Wind load on structures 2. Bibliographies.**—*G.T.*

5J–219 551.58:697(435.15)

Reidat, Rudolf, **Wetter, Bauwesen und Heizung.** [Weather, building methods and heating.] *Nachrichtenblatt für Technik und Wirtschaft im Haushrand,* April/July, **1952.** 10 p. 14 figs. **GB-MO.** Also: **Bauwesen und Wetterdienst.** [Building and weather service.] *Deutsche Holzbau,* Berlin, No. 7/8, 1951. 11 p. 12 figs. Both articles abstracted from reprints. **GB-MO**—A series of diagrams are given and discussed showing solar radiation on walls, flat and sloping roofs on 21 March, June, Sept. and Dec. in 53½°N. Data for Hamburg for heating include wind roses of total precipitation, rain, thundershowers and snow, frequencies of different wind forces, periods year by year 1849–1950 with temperature below 12°C etc. The effect of all these on heating requirements is calculated; a diagram shows increase of heating in terms of daily mean temperature and wind force. Pt. 2 of (1) discusses physiology of room climate including loss of heat of human body, comfort (for sitting or heavy work) in relation to temperature and humidity, effect of wind, difference of wall and air temperature, radiation and convection with different types of heating. The second paper applies similar data for Hamburg to building construction, and discusses also variations of wind force with height, frequency of rain, snow and fog with different wind forces, conductivity and water absorption of various building materials, ground water and ground temperature, and frequency of frost and its penetration in different soils. *Subject Headings:* **1. Climatic effects 2. Building construction.**

5J–220 551.556:69

Tromp, L. A., **La protección contra la amenaza de los ciclones.** [Protection against the menace of cyclones.] *Asociación de Técnicos Azucareros de Cuba, Boletín Oficial,* 11(9):461–472, Nov. **1952.** figs., 12 eqs. **MH-BH**—Calculations show that a wind load of 35–40 lbs/cu ft with a security factor of 4 has to be assumed for structures in Cuba, in anticipation of cyclonic storms. This requirement is applied individually to all parts of a sugar refinery, with diagrams showing the engineering tasks involved. *Subject Headings:* **1. Wind load on structures 2. Engineering meteorology.**—*G.T.*

1954

5J–221 551.506:551.524:551.586:628.8

*Hay, A. Donald, **Summer design temperatures.** *Heating, Piping and Air Conditioning,* Chicago, 26(6):118–121, June **1954.** 2 tables, 3 figs. **DWB**—The following data are tabulated for 66 cities in the U. S.: (1) highest temperature ever recorded, (2) dry-bulb temperature equalled or exceeded 2½% of the total hours of June–Sept., (3) average summer wind velocity, (4) average annual maximum temperature and (5) design dry and wet bulb temperature in common use. Summer wind data for 71 stations in the U. S. are shown in a map. The use of these data in determining most appropriate outdoor design conditions for air conditioning systems is discussed. *Subject Headings:* **1. Design temperatures 2. Summer temperatures 3. Air conditioning 4. United States.**—*G.T.*

5J–222 551.521.16:628.9

Hopkinson, R. G. and Petherbridge, P., **The distribution of sky brightness and its influence on interior daylighting.** *Garston, England. Building Research Station, Note,* No. E451, **1954.** 10 p. 4 figs., 13 refs. Mimeo. **GB-MO**—Observations with a telephotometer at Building Research Station, Watford, on heavily overcast days gave an empirical formula for brightness distribution with altitude which agrees well with that of P. Moon and D. E. Spencer (1946). The mean sky brightness equals brightness at elevation 45°. A method is given for computing direct component of daylight through a window from a non-uniform sky. Some new techniques and instruments for measuring daylight factors are described. The paper is to be published in Proceedings of Inter-Sessional meeting of C.I.E. Technical Committee on Natural Daylight, France, 1953. *Subject Heading:* **1. Daylight illumination.**

SUPPLEMENTARY MATERIAL

5J–223 551.5

Meteorology. *Pennsylvania. State College, Bulletin*, 38(27):9, July 2, 1944. photos. **DWB**— Examples of the practical application of meteorology in the fields of transportation, sports and oth outdoor events, city and highway management, flood control, soil conservation, fruit growin biology and mining are mentioned. Education required for work in meteorology (such as trainir in physics, mathematics and geography) is outlined. A few possibilities for meteorological caree are suggested. *Subject Heading:* **1. Applied meteorology.**—*G.T.*

5J–224 551.5:621.315

Marsch, Oskar, **Klimatische Erprobung von Werkstoffen und Geräten der Nachrichtentechni** [Climatic testing of communications equipment and materials.] *Siemens Zeitschrift*, Berli 26(5):233–239, July **1952.** 16 photos. **DLC.** English version in *Siemens Review*, 20(2):70–7 Aug. 1953. **DBS**—Climatic chambers and testing apparatus designed to simulate 1) hot-hum tropical climate, 2) hot-dry desert climate, 3) intensive insolation, 4) arctic and mountain clima or 5) to produce mechanical shocks are installed in the Siemens Laboratories. Equipment destin for extreme climates is tested in these chambers. The equipment is described and illustrate Examples are given for typical effects of various meteorological factors on equipment used in co munication installations. *Subject Headings:* **1. Weathering of materials 2. Telecommunications.** *G.T.*

5J–225 551.571:620.

Vernon, W. H. J., **Corrosion I. Metallic corrosion.** *Research*, London, 5:54–61, **1952.** 6 fig 26 refs. **DLC**—Corrosion is divided into metal-liquid (electrolytic) reactions (immersed, und ground, atmospheric) and metal-gas (atmospheric, direct oxidation or tarnishing), and the me anism of each is discussed. Atmospheric corrosion is explained as the resultant of film formatio followed by film breakdown under humidity above a critical value (65% for mild steel) aided SO_2 and impurity particles. Protective coatings and other measures are discussed. *Subject Headin* **1. Corrosion.**—*C.E.P.B.*

5J–226 551.5

Collins, George F., **Meteorology in a chemical industry.** *Weatherwise*, 6(2):34–45, April 19 illus. **DWB**—Meteorologists were first employed by Du Pont in 1943 in connection with t construction of the Hanford, Wash., atomic energy works. In 1948 meteorologists were employ in the Engineering Dept. and at present 7 professional meteorologists (with engineering backgroun assigned to the Water, Waste, and Weather Consultant Group (in the Engineering Dept.), assist planning and operational activities of the Company. Among the many services described a illustrated are: 1) studies to help in selecting sites for plants or to determine the best location height of stacks, 2) designing air conditioning equipment, storm sewers, foundations, etc., 3) sampl of air in vicinity of stacks during operation, 4) studies of wind or icing load on structures or po lines, 5) microclimatic studies of frost penetration and temperature conditions affecting insulat of buried pipelines and 6) the issuing of specialized short range forecasts for various construct and operation activities. (*Same item as* 5.5–22, May 1954, *M.A.B.*) *Subject Headings:* **1. Industr meteorology 2. Chemical industries.**—*M.R.*

5J–227 551.55

Golding, E. W., **Electricity generation by wind power.** *Research*, London, 6(4):138–1 April **1953.** 5 figs. **DLC**—The author discusses the emergence of wind power generation in quantitative aspects, wind regions and the selection of sites for aerogenerators, the physical engineering aspects of the extraction of power by wind driven machines, needed wind power resea and development and possible role of international cooperation in wind power investigation. *Sub Heading:* **1. Wind utilization.**—*I.L.D.*

5J–228 551.5:6

Ludlum, David M., **The private practice of meteorology.** *Weatherwise*, 6(5):124–125, **1953. MH-BH**—Educational and training requirements, opportunities and drawbacks to a ca as an independent or industrial meteorologist are outlined. Five fields now open are: (1) employed consultants; (2) groups or associations acting as consultants or engaging in contr forecast or research activity; (3) salaried employees of industrial or commercial outfits; (4) airl meteorologists and employees of large corporations working as a group and (5) teaching in coll or universities. Activities in each category are described. *Subject Headings:* **1. Meteorolog careers 2. Meteorological consultants 3. Industrial meteorologists.**—*M.R.*

5J–229 551.556:69

*Vincent, G. S. (*U. S. Bur. of Public Roads*), **Investigation of wind forces on highway bridges.** *National Research Council, Wash., D. C. Highway Research Board, Special Report,* No. 10, **1953.** 30 p. tables, numerous figs. **DWB**—Wind tunnel tests on various types of model bridges are reported. Force and moment coefficients determined at 100 mph showed that the wind forces generally increase with increased width of bridge, without a consistent correlation. Lifting and overturning forces not provided for in 1953 American Association of State Highway Officials Bridge specifications are identified. *Subject Headings:* **1. Wind load on structures 2. Engineering meteorology.**—*G.T.*

5J–230 551.556.3

†World Meteorological Organization, **Energy from the wind. Assessment of suitable winds and sites.** Its *WMO,* No. 32, TP. 10, **1954.** Also: Its *Technical Note,* No. 4, **1954.** 205 p. 14 figs., bibliog. p. 155–195. **MH-BH**—This report contains a simple discussion of the general physical principles underlying the general circulation with special reference to wind flow, the nature of wind energy calculation of mean scalor wind velocity, wind measurement, the application of wind energy potentials by the use of empirical and statistical techniques, vertical profile of wind speed, selection of suitable sites for installing wind turbines and the topographical effects of sites. An analysis of wind records and wind energy potentials with particular reference to arid and semi-arid regions of the world and tables containing details of stations for which wind records are available and the mean speed values are presented. The criteria for the selection of wind-power sites are discussed. In addition, extensive bibliographies dealing with wind energy and its utilization and special winds are included. *Subject Heading:* **1. Wind utilization.**—*I.L.D.*

5J–231 551.58:6

Sanson, J., **Climatologie appliquée.** [Applied climatology.] Paris, Editions Blondel la Rougery, **1949.** Edition of 1943, rev. in 1948. 2 v. (text in v. 1, plates in v. 2). forms, plates (col.), tables, diagrs., bibliog. v. 1, p. [211]. **DWB**—An elementary and descriptive presentation of the subject matter of climatology and of its practical application in agriculture and in aviation, designed apparently to serve as a handbook for climatologists. The discussion concerns the following topics: collection and verification of meteorological observations, phenological observations and organization of the climatology section of the French Weather Service, description of French climatological publications, application of punched card methods and a history of the French Weather Service since 1864; the meteorological elements of climate and other climatic factors such as geologic, geographic and oceanic; the various climatic classification systems and the various climatic zones of the earth; the characteristics of the climatic elements in France and the climatic regions of France and of the French colonies; aviation and agricultural climatology; medical and resort climatology, including air conditioning; dynamic climatology including a brief account of air masses and fronts; a brief note on microclimatology and a discussion of the application of climatology to industry, rain insurance, tourism, etc. There are also numerous standard tables with climatic data for France and her colonies and map of France showing the variation of the climatic elements. Vol. 2 contains the following: isothermal maps showing for France the mean monthly temperature, precipitation and wind direction for Jan., April, July and Oct.; mean annual number of days with frost etc., duration of insolation, reproduction of (1) forms of various types of meteorological, climatological, phenological observations and (2) of published weather summaries; photographs of meteorological apparatus and color plates showing the phenological characters of various indicators. *Subject Headings:* **1. Applied climatology 2. Climatic data. I. France. Météorologie Nationale.**—*I.L.D.*

5J–232 551.582:69(71)

Building Research in Canada. Published by the Division of Building Research, National Research Council, Ottawa, Canada. W. H. Ball, Editor. v. 1, No. 1, June 30, **1951.** Latest issue seen v. 1, No. 5, June **1953.** Semi-annual? "Price: $1.00 per 4 issues." v. 1, No. 1, 32 p. **DLC**—For the purpose of building research, Canada is divided into 5 climatic regions. The first regional research station was set up in the Prairie region at Saskatoon in 1948. Work of these centers in collaboration with the universities is described. Most of the work involves testing walls, etc. for effects of rigorous climatic conditions. Besides reports from regional centers about their work, abstracts and reviews of pertinent literature are included. Numerous research projects are briefly summarized; among these are studies made in foreign countries, translations, and local studies of arctic soils, heat pump, snow surveys, permafrost, floods and conditions in test huts or buildings, condensation in buildings, soil temperatures, etc. A new journal devoted to articles, reports of research, abstracts of literature, lists of publications, moving pictures, lists of foreign visitors and other pertinent information for the use of building interests. *Subject Headings:* **1. Building research 2. Climatic design 3. Serial publications 4. Canada. I. National Research Council of Canada. Division of Building Research.**—*M.R.*

5J–233 551.586:3

Jacobs, Woodrow C., **Wartime developments in applied climatology.** *Meteorological Mono graphs* (American Meteorological Society), Boston, 1(1), **1947.** 52 p. 27 figs., 4 tables. **DLC**— In business or industrial planning and operations, just as in military planning (both long and shor range), the use of climatological data or information specifically tailored toward the immediat requirement, can be a deciding factor in success of the undertaking. In this monograph Dr. Jacob cites numerous instances or types of study and presentation of data for the armed forces and show how the same techniques developed in his section of the U. S. Air Weather Service between 194 and 1946 can be applied to the solution of peacetime business problems. He states that "In n case was there any real requirement for purely climatological information as such" and that althoug there is some justification for general climatic studies to fit a particular class of users, more ofte than not such studies invite *misuse* by the layman. The monograph discusses and illustrate vividly the techniques used which involve 1) theoretical approach, 2) statistical methods, 3) use synoptic parameters, and 4) a combination of the three. Use of world-wide climatic data to dete mine effectiveness of solar stills and use of rainwater over oceans (for life rafts), or to plan use wing de-icing boots by aircraft, use of wind data for airport design, or of synoptic data to determi danger periods for fires in a given locality, and the use of climatology by forecasters are among t many graphic presentations included and discussed. The use of color charts and "models" also illustrated vividly. The documentation, processing and filing of basic climatic data; the bas for a synoptic or "synchronous" climatology; problems associated with presentation of climat information; and philosophical consideration are also treated in separate sections. *Subject Heading* **1. Applied climatology methods 2. Visual presentation 3. Climatic data presentation 4. Milita climatology.**—*M.R.*

5J–234 551.586:65

Landsberg, Helmut E., **Include climate in highway plans.** *Better Roads*, Chicago, 17(3):25–2 March **1947.** 4 figs., 3 illus. **DLC**—"In building roads, climate is one of the basic elements th should be considered in the earliest stages of planning. Weather and climate are not unamenab to sound management, but they must be planned for on a scientific basis to attain best result Special consideration is given to snow problems (such as those arising from snow precipitatio snow accumulation and snowdrifts), sand drifts, frost problems (penetration, heaving, etc.), micr climatic differences, floods and gales. This article prompted a number of communications fr engineers which were printed in *Better Roads*, 17(4):42–46, April 1947; the last and most co prehensive communication, by H. Radzikowski, appeared in *Better Roads*, 17(7):33–36, July 19 *Subject Headings:* **1. Highway engineering 2. Applied climatology.**—*M.R.*

5J–235 551.5

Weather—friend or enemy? *Inside Line*, Milwaukee, Wisc., Sept. **1954.** p. 3–6. photo diagr. **DWB**—Cites and illustrates a number of examples of how the weather affects the tra former business. Extended drought in Arkansas and an unseasonal cold snap in Florida incre sales, and heavy rains in California, which lead to less irrigation, cause transformer sales to fall Sleet storms, wind storms, lightning, tornadoes and hurricanes play havoc with public utility co panies and their supplies of equipment are quickly depleted. Article closes with a description of t Line Material Company's procedure for supplying necessary equipment to power companies in emergency. *Subject Headings:* **1. Industrial meteorology 2. Electric power systems.**—*M.L.R.*

PART III. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

Note: The contents of periodicals included in this section are for information only, and will not be listed in the monthly indexes until abstracted. When material is furnished in advance of date of publication, the pagination may be omitted.

American Meteorological Society, Bulletin, Volume 35, Number 7, September 1954.

Newton, C. W.: **Analysis and data problems in relation to numerical prediction,** p. 287–294.
Gustafson, A. F.: **The error in Rawin computations due to neglecting the earth's curvature,** p. 295–300.
Rommer, B. R., *et al.*: **Atmospheric oscillations and related synoptic patterns,** p. 301–309.
Schaeffer, Vincent J.: **Concentration of ice nuclei in air passing the summit of Mt. Washington,** p. 310–314.
List, R. J.: **On the transport of atomic debris in the atmosphere,** p. 315–325.
Program, 132nd National Meeting, American Meteorological Society, Philadelphia, Pennsylvania, September 21, 1954, p. 325.

Időjárás, Budapest, Volume 57, Number 6, November/December 1953.

Dési, Frigyes: **Meteorológia a mezőgazdaság szolgálatában,** [Meteorology in the service of agriculture], p. 321–322.
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Berényi, Dénes: **Megjegyzések az évi csapadékmennyiségek sokéves átlagaihoz,** [Comments on long-period averages of annual precipitation amounts], p. 360–365.
Current Weather
Frontátvonulási jegyzék Budapestről 1953. November–December, [List of frontal passages, Budapest, November–December 1953], p. 366–367.
Aujeszky, László: **Légtömegnaptár,** [Air mass calendar], p. 367–368.
Bascó, Nándor: **Magyarország időjárása 1953. November és December Havában,** [Weather in Hungary during November and December 1953], p. 368–370.
Dezső, Loránt: **A nap felületének jelenségei 1953. október–decemberében,** [Solar activity during October–December 1953], p. 371–372.
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Iarine Observer, London, Volume 24, Number 166, October 1954.

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Tomoda, Y. and Aki, K.: **Magnetic recording seismometer by means of moving mag** (Contribution No. 4)
Kasahara, Akira: **A note on the vertical structure of the pressure and temperature fields typhoon.** (Contribution No. 5)
Ogura, Yoshimitsu: **Note on the theory of turbulent diffusion in the lower layer of the mosphere.** (Contribution No. 6)
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Weatherwise, Volume 7, Number 4, August 1954.

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In this list the preferred form of title entry is given in bold face type. If the title is distinctive, the name and headquarters of the issuing society or organizations follows the title. If the title is not distinctive (for instance, Bulletin, Journal, Trudy, Mitteilungen), the entry consists of the issuing body followed by the title.

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Académie des Sciences, Paris, Comptes Rendus.
Akademiia Nauk SSSR, Izvestiia, Ser. Geogr. and **Ser. Geofiz.**, [Moscow].
American Geophysical Union, Transactions, National Research Council, Washington.
★**American Meteorological Society, Bulletin,** [Boston].
★**Angewandte Meteorologie,** [Potsdam].
Annales de Géophysique, Centre National de la Recherche Scientifique, [Paris].
★**Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A** and **Ser. B,** [Vienna].
Australian Journal of Physics, [Melbourne].
Ciel et Terre, Société Belge d'Astronomie, Météorologie et Physique du Globe, [Brussels].
★**Geofisica e Meteorologia,** Società Italiana di Geofisica, [Genoa].
Geofisica Pura e Applicata, Istituto Geofisico Italiano, [Milan].
Geophysical Magazine, [Central Meteorological Observatory, Tokyo].
★**Időjárás,** Magyar Meteorólogiai Társaság and Országos Meteorológiai Intézet [Budapest].
★**Indian Journal of Meteorology and Geophysics,** [Delhi].
★**Journal of Atmospheric and Terrestrial Physics,** [London].
Journal of Geophysical Research, [Washington].
★**Journal of Meteorological Research,** [Tokyo].
★**Journal of Meteorology,** American Meteorological Society, [Boston].
★**Journal Scientifique de la Météorologie,** Société Météorologique de France, [Paris].
★**The Marine Observer,** Air Ministry, Meteorological Office, London.
★**The Meteorological Magazine,** Air Ministry, Meteorological Office, London.
★**Meteorological Society of Japan, Journal,** Second Series, Kisho Shushi, [Tokyo].
★**La Météorologie,** Société Météorologique de France, [Paris].
★**Meteorologische Rundschau,** [Bad-Kissingen].
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★**Monthly Weather Review,** U. S. Weather Bureau, Washington, D. C.
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★**South Africa. Weather Bureau, Notos,** [Pretoria].
★**Tellus,** Svenska Geofysiska Föreningen, Stockholm.
Vsesoiuznoe Geograficheskoe Obshchestvo, SSSR, Izvestiia, [Moscow-Leningrad].
★**Weather,** Royal Meteorological Society, [London].
★**Weatherwise,** American Meteorological Society [Boston].
★**Wetter und Leben,** Österreichische Gesellschaft für Meteorologie, [Vienna].
★**WMO Bulletin,** World Meteorological Organization, [Geneva].
★**Zeitschrift für Meteorologie,** Meteorologisches Observatorium, Potsdam.

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